THE IRON AGE

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The Westinghouse-Leblanc Condenser.*

BY EDWIN YAWGER.†

The Westinghouse-Leblanc condenser bears the same relation to the familiar type of condensing apparatus that the steam turbine does to the reciprocating engine. It is in fact a turbine type condenser. Like the turbine, it occupies only a small fraction of the space formerly allotted and develops superior efficiency through a simple application of rotary motion, with no reciprocating or rubbing parts and no valves.

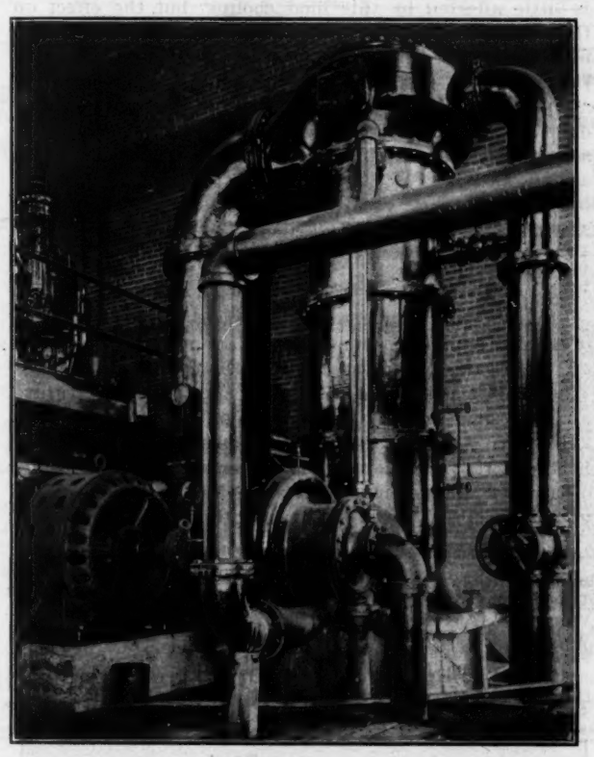

Fig. 1.—A Motor Driven Westinghouse-Leblanc Condenser Serving a 1000-Hp. Turbine.

At the time of the introduction of the steam turbine it was announced that a very high vacuum would improve turbine economies to an extent hitherto impossible when applied to reciprocating engines. It became evident at once that the old types of condensers, good enough for 25 and 26 in. vacuum, would be practically useless for a vacuum of 28 or 29 in. While many refinements have been made in all features of condenser design, they have been generally along the lines of former practice. The principal improvement has been to apply a separate dry vacuum pump for the removal of air and noncondensable vapors. The dry vacuum pump, as commonly constructed, is a direct steam driven reciprocating unit, with its air cylinder and valve mechanism designed to reduce as far as possible the return to the condenser of the compressed air from the clearance spaces. When it is realized that the air following back from the clearance will exceed many times the original volume it becomes evident that the ideal vacuum will never be reached by the reciprocating type of pump.

In the effort to overcome these inherent defects builders have resorted to numerous refinements. Air cylinders are water jacketed to prevent overheating. Mechanically operated air valves are introduced to prevent the building up of a back pressure in the condenser sufficient to lift voluntary valves from their seats. Two air cylinders are sometimes put in series, which manifestly improves the efficiency. An additional set of flash parts is sometimes introduced, which permits the air compressed in the clearance to be almost instantaneously discharged into the opposite end of the cylinder, just before the suction valves open. This last would largely remove the bad effect of clearance if it did not in a measure defeat itself. The sudden expansion resulting causes a re-evaporation of the moisture on the cylinder walls, and hence no air can enter from the condenser until the piston has traveled far enough to equalize the pressure. The net result of the combination of such expedients is to impose a burden of first cost and maintenance that will overbalance the doubtful benefits to be secured by extreme complication.

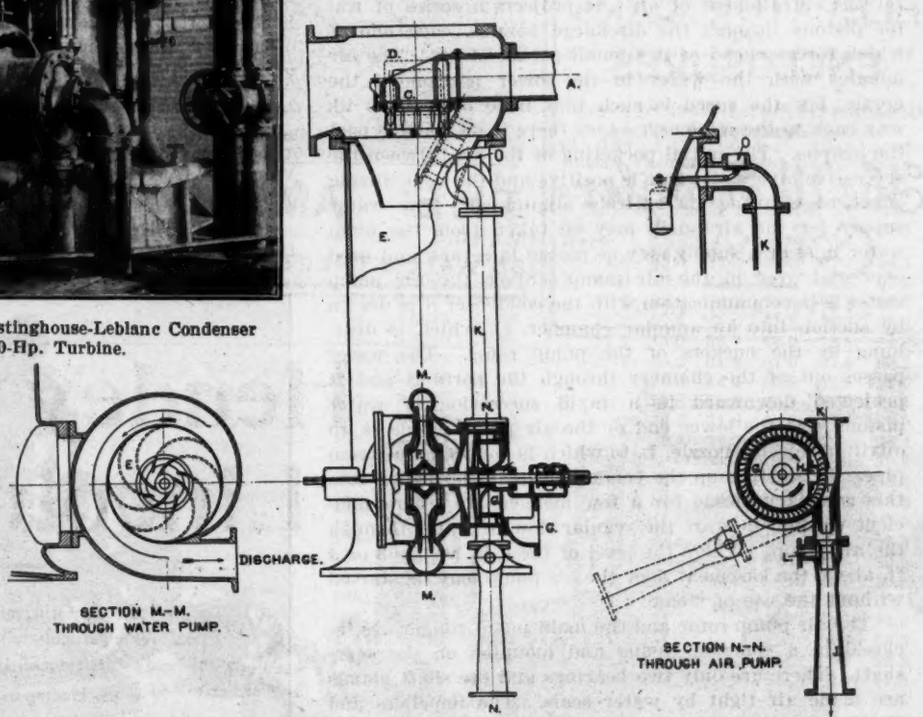

Fig. 2.—Details of the Condensing Chamber and Water and Air Pumps.

Essential Features.

The most striking feature of the Leblanc condenser, as may be judged by the view of an installation given in Fig. 1, is its compactness and simplicity. While it employs the excellent feature of separate removal of water and air, its functions are performed by a pair of small turbine type rotors on a common shaft, in a single unit casing, which is integral with the lower portion of the condensing chamber. The condensing chamber is of small diameter, being but slightly larger than the exhaust opening of the engine. The pre-eminent superiority of the

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system lies in the practically perfect removal of air and noncondensable vapors. The detailed description of the air pump, given later, shows how this result is obtained by mechanism that is practically indestructible.

A general sectional view of the standard Westinghouse-Leblanc condenser is given in Fig. 2. Exhaust steam enters at D and cooling water, entering through pipe A, is projected downward through spray nozzles B. The injection water and condensed steam flow to the centrifugal discharge pump M under a head of 2 or 3 ft., which insures positive filling of the pump. The exhaust steam is drawn downward and condensed by the water spray. The space E above the water is occupied by water vapor and the air released from the injection water

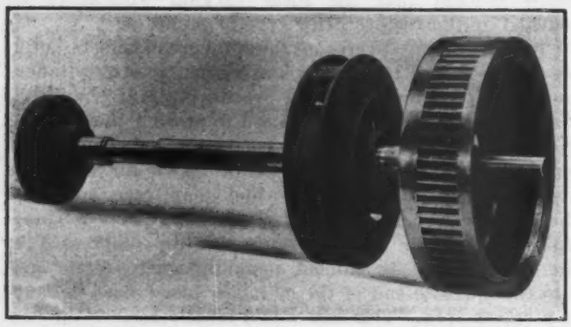


Fig. 3.—The Pump Impellers.

and from the exhaust steam. This space communicates with the air pump N through pipe K.

The Air Pump.

The air pump is entirely new in principle and differs from all ejector type pumps which depend on friction for the entrainment of air. It projects a series of water pistons through the discharge nozzles, each one of which forces ahead of it a small pocket of air. The air mingles with the water in the lower portion of the nozzle, but the speed is such that none of it finds its way back to the condenser—*i. e.*, there is no leakage past the pistons. The initial pocketing of the air between the successive layers of water is positive and the neutralizing effect of clearance is entirely eliminated. The water supply for the air pump may be taken from the main water inlet or a supply may be placed in a tank and used over and over in the air pump. Since the air pump water is in communication with the condenser it is drawn by suction into an annular chamber, G, which is overhung by the buckets of the pump rotor. The water passes out of the chamber through the ports H and is projected downward in a rapid succession of water pistons. At the lower end of the air pump nozzle is an auxiliary ejector nozzle, L, to which is connected a steam pipe. In starting up the condenser steam is turned into this auxiliary nozzle for a few moments to create sufficient vacuum to start the regular flow of water through the air pump. Where the level of the cold well is 3 or 4 ft. above the basement floor the air pump may be started without the use of steam.

The air pump rotor and the main pump runner are inclosed in a common casing and mounted on the same shaft. There are only two bearings and the shaft glands are made air tight by water seals. The impellers and shaft removed are shown in Fig. 3.

Power Requirements.

The pumps are usually driven by a Westinghouse steam turbine and under ordinary conditions require from 2 to 3 per cent. of the power generated by the main engine. The exhaust from the condenser turbine is utilized for heating feed water and when combined with the exhaust of other plant auxiliaries the quantity is just about sufficient to maintain a feed temperature of 212 degrees F.

Where economizers are used, or there may be extra sources of exhaust steam, it would be advisable to operate either the condenser pumps or the exciter by an electric motor. The main pump is commonly designed to discharge against only a few feet head, sufficient to overcome friction in the discharge line. If it is desired to elevate the water to the top of cooling towers, or other moderate elevations, the pump can readily be modified to meet the additional duty.

Counter-Current Principle.

This term is often used in connection with various apparatuses whose functions involve a transfer of heat. Aside from its application to surface condensers, it is generally ignored by jet condenser builders, although sometimes vaguely referred to. In general it may be said that counter-current principle as applied to a cooling process consists in so disposing the cooling medium that the substance being cooled will at the instant of withdrawal be subjected to the full effect of the lowest temperature. Thus, in a surface condenser the water is introduced at the top and the steam at the bottom, which, rising to the top, is exposed to the entering cold water. The air, which is always present, being noncondensable, is little affected by this final cooling, but the effect on the final volume of steam is remarkable, a much greater proportion of it being condensed in the cooler region, and the air pump, instead of handling a certain volume of air plus a relatively large volume of steam, is enabled to draw out a mixture from which a large part of the steam as such has been eliminated. This law may be illustrated as follows:

Case I.—Slight Counter-Current Effect.

Assume initial temperature injection water =.....70°
Temperature at which air is removed =.....90°
Vacuum (temperature 101.3°) =.....28 in.
Weight of air entering condenser per minute =.....1 lb.

In this case, owing to an excess of cooling water as ordinarily supplied, the mixture of air and vapor is taken off in a partly cooled condition—*i. e.*, from 101.3 degrees (the hottest point) to 90 degrees. At this temperature and pressure the volume of the pound of air alone is 221 cu. ft., while the volume of the steam in the mixture is 539 cu. ft. Therefore, the air pump, to extract a pound of air per minute, must have an effective displacement of 221 + 539 = 750 cu. ft. per minute.

Case II.—Full Counter-Current Effect.

Assume initial temperature injection water =.....70°
Temperature at which air is removed =.....70°
Vacuum (temperature 101.3°) =.....28 in.
Weight of air entering condenser per minute =.....1 lb.

In this case the full counter-current effect is realized, the mixture of air and steam being taken off at 70 de-

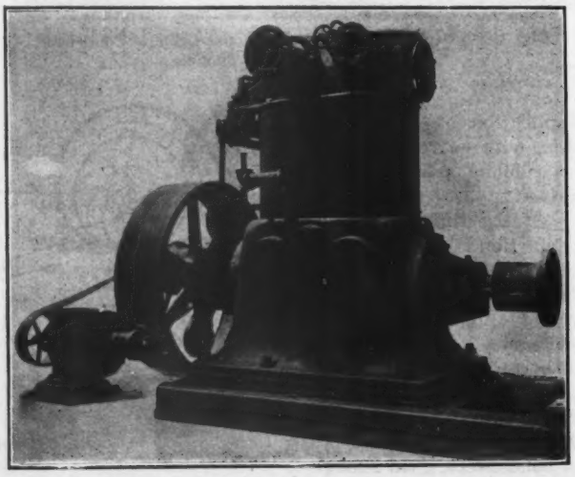


Fig. 4.—A Westinghouse-Leblanc Ejector Condenser as It Would Be Operated in Connection with a Westinghouse Vertical Compound Engine.

grees (a cooling of 31.3 degrees below the hottest part). At 70 degrees the volume of 1 lb. of air alone is 213 cu. ft., while the volume of steam in the mixture is only 125 cu. ft., making a total of 338 cu. ft. for the air pump to handle, or less than half the size required for case I.

These relationships remain the same whether the cooling is done in a surface or a jet condenser, and the Leblanc air pump as applied to either type combines in its cold circulating water both the means for expelling the

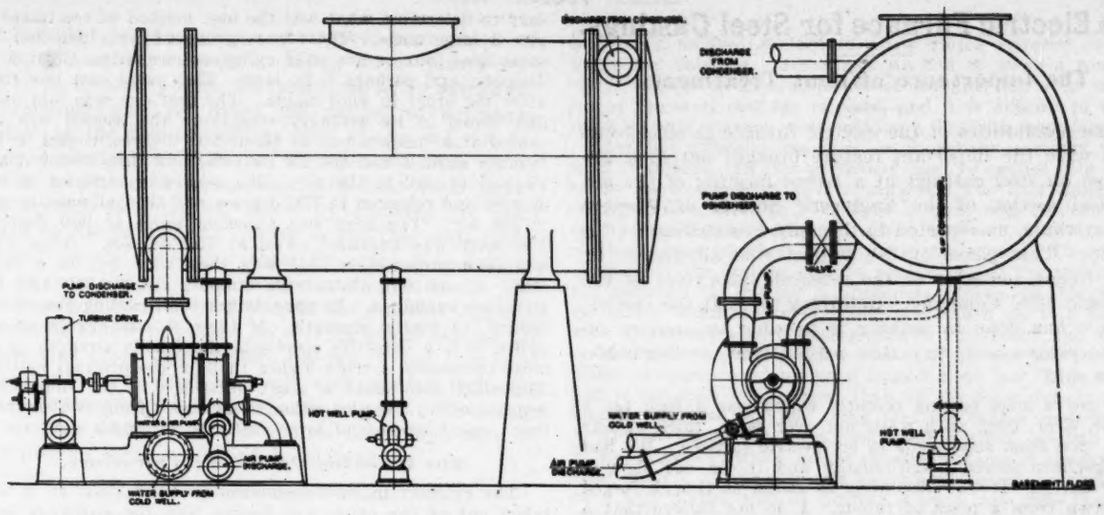


Fig. 5.—Side and End Elevations of a Surface Condenser Equipped with the Westinghouse-Leblanc Water and Air Pumps.

air and simultaneously cooling the mixture to the point of minimum volume.

Small Sizes and Separate Air Pumps.

For units smaller than 300 hp. it is customary to eliminate the main condensing chamber and pass all the exhaust steam, as well as the air, through the air pump only. For this service the air pump is slightly modified, a relatively greater amount of water being used, which serves both to expel the air and condense the steam in one operation. The same high efficiency is maintained, and the apparatus occupies scarcely more space than that required for the exhaust pipe alone. The performance of this type is shown by tests recorded later, and Fig. 4 illustrates a vertical steam engine equipped with one of these small condensers.

For use with surface condensers, both stationary and marine, and for application to barometric and other types of jet condensers, evaporating pans, &c., the air pump is furnished separately. Embodying as it does the vital element of the Leblanc system, its application in any situation requiring an efficient vacuum will insure a marked improvement in the effectiveness of the entire equipment. In the case of new installations of surface condensers the air pump and the circulating pump may be combined in a single compact unit substantially as shown by Fig. 5.

The First Year's Showing.

At the present writing there have already been contracted for in this country over 60 Leblanc condensers, aggregating 75,000 hp. Most of these serve turbines of various types, while a few, especially small ones, are used with reciprocating engines. Results obtained from some of these plants are set forth in the following tables:

Shop Test.—East Pittsburgh.

No. 12 Condenser.—Capacity and Efficiency.

Steam condensed. Pounds per hour.	Temperatures. Injection.	Discharge.	Vacuum referred to a 30 in. barometer.	Per cent. of ideal vacuum.
11,400	65	79	28.76	99.5
18,300	70	92	28.09	98.8
25,000	71	97	27.96	99.3
32,100	70	104	27.59	99.3
38,600	70	112	26.81	98.8
11,300	55.3	72	29.06	99.5
18,400	56.5	86.3	28.44	99.4
25,000	62.3	94	28.21	99.7
32,100	65.5	103	27.51	99.0
37,500	54.0	102	27.56	99.0

Jersey Central Traction Company, Keyport, N. J.

No. 5 Condenser.—Capacity and Efficiency.
(Rated capacity 8380 lb. steam condensed at 27-in. vacuum and 90 degrees injection temperature.)

Steam condensed. Pounds per hour.	Temperatures. Injection.	Discharge.	Vacuum referred to a 30 in. barometer.	Per cent. of ideal vacuum.
5,680	85.5	100.5	27.8	99.1
9,200	87.0	108.0	27.3	99.1
12,000	88.0	120.0	26.4	99.4
15,000	87.0	124.0	26.1	99.7
19,000	87.0	139.0	24.0	98.9

Union Sand & Material Company.

No. 5 Condenser.—Efficiency Only.

Temperature discharge.	Vacuum referred to 30-in. barometer.	Per cent. of ideal vacuum.
75	28.9	99.2
80	28.7	99.1
82	28.7	99.3
78	28.6	98.5

(Practically full load was maintained during the above readings—viz., from 450 to 525 kw. on the turbine.)

Jacksonville Oil Mill Company, Jacksonville, Ala.

No. 1 Condenser.—Efficiency Only.

Temperature discharge.	Vacuum referred to 30-in. barometer.	Per cent. of ideal vacuum.
102	27.86	99.6
106	27.66	99.8
95	28.18	99.5

Relative Volumes of Air and Steam in a Saturated Mixture at Various Temperatures.

Temperature. Degrees F.	Pounds per sq. in. abs. No air present.	Inches vacuum referred to 30-in. barometer. No air present.	Pounds Per Square Inch Absolute. 0.49	0.98	1.47	1.96	2.45	2.94	14.697
			Inches Vacuum Referred to a 30-in. Barometer. 29	28	27	26	25	24	0
			Per Cent. Volume of Saturated Air Present in a Mixture of Air and Vapor of Water.						
60	0.2545	29.48	48.0	74.0	82.6	87.0	89.5	91.4	98.4
70	0.3602	29.26	26.5	63.0	75.5	81.5	85.5	87.8	97.6
80	0.5027	28.97	...	48.6	65.8	74.3	79.5	82.9	96.7
90	0.6925	28.59	...	29.4	52.9	64.6	71.8	76.4	95.4
95	0.8090	28.35	...	17.4	45.0	58.7	67.0	72.5	94.6
100	0.9421	28.08	...	38.7	35.9	51.9	61.5	67.9	93.7
105	1.0938	27.77	...	...	25.6	44.2	55.3	62.8	92.6
110	1.2633	27.42	...	...	13.8	35.4	48.3	56.9	91.4
112	1.3416	27.26	...	...	8.7	31.6	45.3	54.4	90.9
114	1.4207	27.10	...	...	3.3	27.5	42.0	51.6	90.4
116	1.5039	26.93	...	...	...	23.3	38.6	48.9	89.8
118	1.5912	26.75	...	...	...	18.8	35.05	45.85	89.3
120	1.6828	26.57	...	...	...	14.1	31.3	42.8	88.6
122	1.7789	26.37	...	...	...	9.3	27.4	39.5	88.0
124	1.8797	26.17	...	...	...	4.1	23.3	36.1	87.3
126	1.9852	25.95	...	...	...	...	18.96	32.5	86.6
128	2.0959	25.73	...	...	...	...	14.45	28.7	85.8
130	2.2119	25.48	...	...	...	...	9.72	24.8	85.0
132	2.3333	25.24	...	...	...	...	4.77	20.6	84.2
134	2.4603	24.90	...	...	...	...	...	16.3	83.3
136	2.5932	24.71	...	...	...	...	...	11.8	82.5
138	2.7321	24.42	...	...	...	...	...	7.07	81.5
140	2.8774	24.13	...	...	...	...	...	2.13	80.5

Efficiency is here expressed by the percentage of an ideally perfect vacuum actually obtained. For instance, if the discharge temperature is 100 degrees F., the corresponding ideal vacuum would be 28.08 in. If, however, the observed vacuum is 27.75 in., the efficiency percentage would be $\frac{27.75}{28.08} = 98.8$ per cent.

The Bethlehem Steel Company has again been defeated in its suit against the Niles-Bement-Pond Company for infringement of patents covering the former's process of treating high speed tool steel. The adverse decision of the Circuit Court of New Jersey was approved July 21 by the United States Circuit Court of Appeals.

The Electric Furnace for Steel Castings.

The Importance of Heat Treatment.

The possibilities of the electric furnace in steel foundries were the important feature brought out in a discussion on steel castings at a recent meeting of the mechanical section of the Engineers' Society of Western Pennsylvania, as reported in the July Proceedings of the society. This phase of the subject was alluded to by J. S. Unger, manager of the research laboratory of the Carnegie Steel Company. Referring to what the electric furnace has done in making it possible to produce intricate shapes and very thin walled steel castings, Mr. Unger said:

I saw a steel casting recently which was a fork for a bicycle, 6 in. long, with walls not over ⅛ in. thick at any point, cast from steel made in an electric furnace. We had the specimen sawed longitudinally and it did not show a single cavity. It was absolutely as sound as though forged or drawn from a piece of tubing. I do not believe that a casting with walls as thin as that could be made in an ordinary steel furnace. It is possible to raise the temperature of the steel in an electric furnace to such a high point that it will flow in as thin a wall as that, while the reducing action of the electric furnace prevents many of the gases from being occluded. There is not any bubbling or motion at all while the casting is being poured. While I do not wish specially to recommend electric steel casting, I bring this up to show that very small steel castings can be made in an electric furnace. Most steel casting people say that sound castings with very thin walls cannot be made in a steel furnace, and I agree with them. But there is another method of doing this.

. . . When you consider that the temperature of an open hearth furnace is not over 150 degrees above the melting point of steel, you realize that the steel foundryman's means are limited. The steel is being made under oxidizing conditions and absorbs and holds large amounts of gases in solution, giving up a portion of these on cooling, producing sponginess. If he could raise the temperature of that steel by means of the electric furnace to almost 1000 degrees above the melting point and make the steel under reducing conditions, he could make sound castings that under ordinary conditions he cannot secure. Say the melting point of steel is 1600 degrees, a good open hearth furnace will be about 1750 degrees, while an electric furnace will work at 2600 degrees.

Heat Treatment of Special Steels.

The questions of design and of heat treatment were discussed by a number of speakers at the same meeting. On the latter head Mr. Unger gave interesting comment and experience, as follows:

We should not forget something that is very important in steel casting, and that is treatment. I know that the price at which we buy ordinary steel castings to-day will not justify a treatment that is at all complicated or that will cost much money. However, one is almost compelled to use steel castings in some cases, owing to difficulties in preparing a forging of the design suitable for the purpose. At the present time in some classes of work, automobiles, for instance, they are making special castings of alloys which contain such metals as nickel, chromium, vanadium, titanium and quite a number of other metals alloyed with the ordinary constituents of steel. Some of these alloys have given very excellent results.

One finds that when using a special alloy of any kind, in order to get the best results and develop the best qualities in the steel, it is necessary to treat it, not simply to anneal it, but to give it treatment more or less complicated, depending on the results required. Ordinarily treatment by heating the casting to the proper temperature, then plunging it into oil and chilling it, afterwards reducing the hardness produced by the oil, is sufficient. There are special alloy castings in which ordinary treatment in oil is not sufficient, but water must be used to obtain the results, the oil not being sufficient to break up the coarse grain or structure. It is possible by treatment to make these special castings the equivalent of a forging. The effect of treatment is especially noticeable in manganese steel castings. It is a common and necessary practice among those who manufacture manganese steel to heat the article to approximately 950 degrees, plunge it into cold water and leave it until it is absolutely cold. This develops the characteristic toughness and increases the hardness to a higher point than it was prior to this treatment.

I believe flask annealing is practiced to some extent. Flask annealing may be a benefit, but I do not believe it is as beneficial as removing the casting from the flask and reheating to the proper temperature, allowing it to cool slowly. In some experiments I had knowledge of, it was necessary to determine what was the best method of treatment to give a large mass. There were prepared from one and the same heat four or five solid cylinders measuring about 4 in. diameter and perhaps 6 ft. long. They were cast one right after the other in sand molds. The first one was laid aside and tested in its ordinary condition; the second was annealed at a temperature of about 900 degrees, cooled in the furnace until it had lost all its color and then removed and allowed to cool in the air. The next was annealed at 900 degrees and reheated to 750 degrees and then allowed to cool in the air. The next was annealed twice at 900 degrees. The next was annealed twice at 750 degrees. After they had been prepared in this way they were put in a large lathe, a nick cut around the outside, and broken and the structure examined. In annealing a steel casting you rarely reduce the tensile strength. If there is any change at all, unless it is a defective specimen, the tensile strength is almost invariably a trifle higher than in the original casting. Annealing does make a great difference in the elongation. Approximately the elongation is increased from two to three times, speaking now of large castings, not small ones.

The Breaking Up of Coarse Structure.

The cylinder in its unannealed condition, just as it was taken out of the sand, was broken and the structure over the entire surface was examined and found to be very large grains, octahedral in character, from ⅜ to ½ in. through the crystal. One blow of the drop broke this cylinder. The next one, that had been heated to 900 degrees and cooled in the furnace until it lost color, also broke at one blow, the difference in structure being noticed for about 10 in. from the outside. The coarse grains had disappeared, but the extreme center was still coarse, showing that the treatment had not affected it throughout, and there was still a central core that seemed to be just as it was in the original casting. The next cylinder, which had been treated at 900 degrees and then at 750 degrees, showed practically the same appearance, the effect of the treatment having been felt for about 12 in. from the outside, but the grain was finer than that produced by annealing at 900 degrees only. The next cylinder, which had been annealed twice at 900 degrees, showed that the effect of this treatment had been felt almost to the center. There was a small portion, perhaps 6 in., in the center still coarse grained. The next one, that had been treated twice at 750 degrees, was very fine for 4 to 6 in. in from the outside, the remainder being coarse.

The object of using these two temperatures was this: If one can break up the coarse structure produced in a casting or forging at a low temperature you will get a finer and stronger grain. But the coarse fracture that is produced in the large casting that cools slowly in the sand is not readily broken up at a temperature of 750 degrees. If one could anneal often enough at 750 degrees I believe we would have a stronger casting than when annealed at 900 degrees, but the amount of work and cost would be excessive. It is not practicable, so most manufacturers try to do their annealing at 900 degrees in order to break up the coarse structure and get the desired effect at a minimum cost. We afterward decided that for ordinary large castings, somewhat representing the cylinders I spoke of, there was not enough good effect produced by a first annealing at 900 degrees and reheating at 750 degrees to justify the adoption of that treatment, and the treatment since that time has consisted of removing the casting from the sand, heating it up to 900 degrees and holding it there when that temperature is reached to allow the casting time to lag. By that I mean to give the grains time to rearrange themselves and allow for that chemical change in the carbon which occurs to a greater or less extent. After the casting has reached 900 degrees one should maintain that temperature for approximately 1½ or 2 hr. to be sure that the change has taken place. Then you may begin to reduce the temperature in the furnace. I do not believe there is any real benefit to be derived in allowing a casting to soak a long time in the furnace. When it has reached the proper temperature and is of the same temperature throughout no further good can be accomplished by allowing it to cool down very slowly. After it shows no visible color in the furnace, I would recommend removing the casting from the furnace and allowing it to cool in the air. The additional cooling in the furnace is of no benefit to the casting and it only holds the furnace back from further use. . . .

I believe those people who make large castings, say from 15,000 lb. up, now make about as many castings from the basic furnace as from the acid furnace. I believe both make good castings. The basic furnace is a little more difficult to handle than the acid. In addition to being an oxidizing it is a purifying process as well. As the steel casting business is difficult at best, one tries to use the easiest method to arrive at results, and therefore they prefer to use the acid method, it being very much easier to operate.

A Stucki, in speaking of the high shrinkage of steel castings, often twice as great as that of cast iron, said that shrinkage cracks are the result of an improper distribution of metal which in many cases might have

been avoided in the design. At times, however, it is almost impossible to design a casting for a certain purpose so as to comply with the conditions as to machining or fastening and yet avoid the danger of shrinkage cracks. In the case of castings open at one end, for example, U-sections, he said that the open ends are apt to spread, as the intervening sand will hold them apart. This trouble is remedied either by allowing for such spread in the pattern, by closing in the free ends under a press, or by connecting them by extra metal which will be removed as soon as the casting is cool. The latter method is often used to hold the pedestal legs of a locomotive frame in place. In driving wheel centers the spokes cool more quickly than the rim if not prevented by covering with sand, and will pull inward from the rim, producing cracks in the spokes or arms. The piping of castings which cool and reduce in volume may be prevented by large gates and large heads.

Troubles from Bad Design.

C. B. Albree, president of the Chester B. Albree Iron Works, spoke from the standpoint of the customer of the steel foundries:

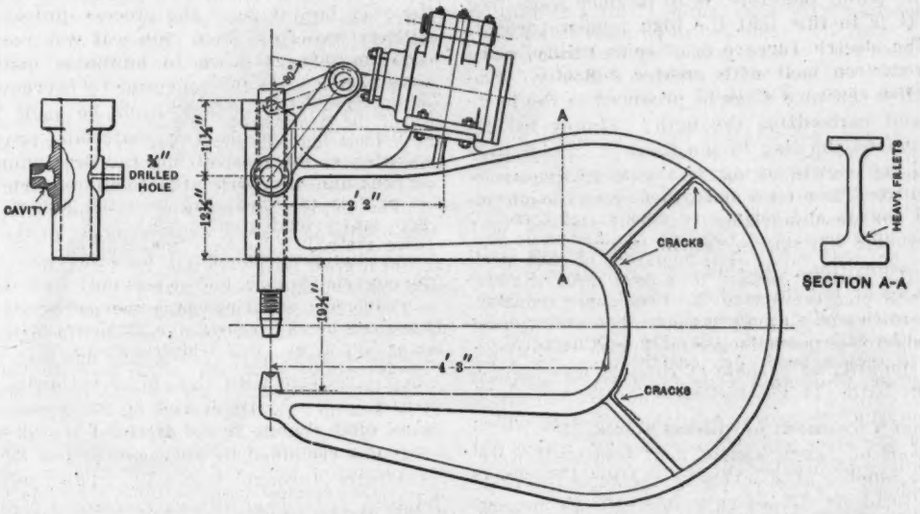
I know very little about the process of making steel castings, but I have been a user of them for riveting machines, and in that line of work we have all sorts of troubles. The majority of machinery manufacturers who use steel castings in place of cast iron on account of strength and reduced weight are much more familiar with cast iron than with steel castings. A drawing of the part required is made and the pattern sent to the foundry, but when the casting is received it is often full of blowholes and out of shape. Surfaces requiring planing do not clean up and blowholes and shrinkage cracks make it impossible to use the casting, necessitating a wait of from one to four weeks for a new one.

Our principal experience has been with riveting machines, as shown in the illustration, which consist of U-shaped parts having a heavy tension section, a lighter compression section and a comparatively thin web. We decided on a very thin web at first and as a result we got a casting that cracked all around the web close to the flanges. The foundryman told us we must have a big fillet to avoid such cracks. Sometimes we found that the foundries were not annealing the castings and we had them annealed, which saved a little trouble. We tried putting in ribs to stiffen the web and that made matters worse, because we got cracks along the ribs. We did away with them and now make the web very heavy without ribs. It took us some time to learn these details and we found that the fewer the stiffening ribs and the heavier we made the web, the better the castings. I think it cost the steel casting people a great deal because we did not know how to design steel castings. If they had told us that we were making a mistake in our designs we would have changed the patterns.

In the matter of cores it has been said that the cores shrink, making the holes smaller than the core. This is certainly true. We have to machine out these core holes and we have found it very decidedly to our advantage to pay for ½ in. more metal and avoid trying to scrape out scale. In steel castings we cannot rely on as accurately cored holes as in iron castings, and it is much better where there is a finished surface to allow ample material everywhere for finishing. Sometimes we had to make a considerable change in measurements of machine parts to make use of the steel castings received, and it is difficult to keep track of such changes when making a duplicate part later.

Another difficulty we meet is in getting castings with solid trunnions. In this particular case we cannot help ourselves, as we have to have trunnions. The first thing we do with these castings is to drill a ¾-in. hole through the center of the trunnions, and about one out of every four castings has a blowhole or cavity in the center. The other portions of the casting may be perfect, yet if the trunnions are defective the casting is absolutely useless, as the greatest strain comes on them. We have taken up this design with almost every steel casting man in Pittsburgh and many outside and practically every one of them has had trouble. These shrinkage cavities have caused more loss, both to us and to the steel casting men, than all the other defects combined. And the peculiar thing that we cannot understand is why we should get three good trunnions and one bad one. It was suggested to me by the president of one of the largest steel casting companies that the trouble could be obviated in a very simple way by putting a small core hole through the center of the trunnions, so the interior would cool as rapidly as the exterior. We have not tested this scheme, but expect to do so soon.

Another point about annealing steel castings. We have received annealed castings from many foundries which came out all right and have received others which from a front view present a badly warped and crooked appearance. The whole thing would be so out of shape that, while it was a perfectly good casting otherwise, we could not possibly use it. My conception of this is that they are not careful enough in supporting it in the furnace when they reheat it, and there is a bending due to the unsupported weight of part of the casting, which sags when it is heated.



Shrinkage Cracks on Steel Casting for Riveting Machine.—Section of the Casting, Also Section of Trunnion Showing Cavity.

We had a machine to build for the United States Government that called for a 12-ft. gap. It made a very heavy casting, about 30,000 lb., and as the pattern was pretty long and difficult to handle the foundrymen, unknown to us, put a piece across the open end of the jaws, 8 in. wide and about 3 in. thick. When we received it this piece was cast in solid and we had to cut it out, which was a rather expensive operation. After cutting it out, the jaws, which were originally 20 in. apart, closed in until the distance was only 17 in. The Government threw it out, the steel foundry lost the casting, and we lost the work on it and had to pay a penalty for delayed shipment.

When it comes to small castings our experience has been very bad and we use forgings throughout. Some of our competitors use steel castings, which are considerably cheaper, and we thought we would try it. We had patterns made of perfectly straight pieces without cores or other troublesome features, and there was no reason why they should not come out right. We tried them on ten different machines, and in every case the castings had such blowholes that they were absolutely useless. We have never yet had a yoke break through where the greatest strain is, under loads of from 50 to 150 tons, on the outer ends of the jaws. We use a fiber stress of 10,000 to 12,000 lb. in designing sections.

It seems to me that the success of a steel casting depends first on its design and second on the foundry; so the customer and the foundryman ought to get together in order to secure successful results.

The Metallurgy of the Electric Steel Furnace.

While technical literature contains a great deal in recent years on different furnace types and on the electrical side of electric steel manufacture, the metallurgical side seems to have been studied very little. The clearest summary of what has thus far been developed has appeared in a paper read before the Verein zur Befoerderung des Gewerbfleisses at Berlin by Professor E. R. Eichhoff, the successor of Dr. Wedding, who has been closely connected with the work at Remscheid.

At first the possibility of obtaining high temperatures and the neutral atmosphere were considered very important features of the electric furnace, and the removal of gases was regarded as attained, since the presence of gas in steel is a function of its temperature. Still, steel saturated with a certain gas may stand for hours without changing its gas contents in the least, provided the temperature remains the same. The deoxidation of the bath is the vital point. Professor Eichhoff reasons as follows:

The entry of the oxygen in the gas is due to the intervention of the protoxides of the slag, which must be removed. The point, therefore, is to produce slags free from iron. It is in this that the high temperature attainable in the electric furnace is of some utility, since slags free from iron melt with greater difficulty. The question is, How can such slags be produced in the basic process without carbonizing the bath? Simply by the use of fine coal on the slag in the furnace. This, however, worked too slowly owing to the large quantities of slag which were then used and which were thought to be necessary for desulphurizing. A trial showed that carbide of calcium did not carbonize the iron, in spite of previous assumptions. Carbide of calcium was used as a reducing agent, but the method proved too expensive. Then the quantities of slag were reduced, which caused the electric arc to be much longer, and with the carbon an adequate quantity of carbide of calcium was formed directly on the bath. It was believed that all difficulties were overcome, since there was available a hearth which did not affect the steel and a cover of slag which did not influence it, and besides cut it off from the effects of the atmosphere.

The disappointment was great when it was discovered that under these conditions the steel contained as much oxygen as before. A series of further experiments were undertaken, which showed that at higher temperatures a combination of oxygen and iron is formed which differs from protoxide of iron, and which is then stable; that the affinity for iron and oxygen rises rapidly with rising temperatures; that the affinity of carbon and iron also rises rapidly with increasing temperature, and that the affinity between oxygen and carbon rises very little relatively with a rising temperature, and probably even declines relatively so long as iron is present. Observation led to the assumption that oxygen combines in some form with iron at temperatures higher than its point of fusion, and that the quantity increases with rising temperature. In this form it cannot be attacked by carbon. When the temperature declines below that corresponding to the point of saturation then oxygen may possibly be expelled in the form of protoxide of iron, and this combines at once with the carbon of the carbide, forming carbonic oxide.

The question arose as to how these observations could be made useful for the deoxidation of the steel below the slag freed from iron. First of all it was found that oxygen could only be expelled where the temperature was lowered close to the point of chilling and reheating followed under the slag free from iron. The small amount of carbon in the steel sufficed to destroy the particles of protoxide of iron, which had not risen to the surface. It was shown very soon, however, that this process worked too slowly; therefore a special addition of carbon was made to hasten the reaction and was combined with the duplex process to be described.

Success crowned the efforts to produce carbide cheaply in the electric furnace and thus to reduce the protoxide of iron in the slag. Success had crowned the deoxidation to the point that no manganese was lost when ferromanganese was added at the end of the heat. The effort was then made to produce cheap manganese directly in the furnace by adding manganese ore directly to the slag.

This represented important progress in three directions: To begin with, all losses of manganese were avoided, the use of expensive ferromanganese was unnecessary, and, finally, the deoxidation by means of carbon and the cooling connected therewith in order to hasten the process could be restricted, because the metallic manganese produced entered the bath, combined with the oxygen of the iron, entered the slag, was again reduced, then to re-enter the bath and continuing this course until all the oxygen had been eliminated and all the manganese had entered the bath.

Until then the practice had been to carry out the melting, the purification and the making of the steel in the electric furnace. Until then it had been assumed that in this way the raw materials would be freed of sulphur and of phosphorus during the middle period. Experiments and observations in melting with slags free from iron showed that desulphurization proceeds independently of the quantity of sulphur very rapidly toward the very last stage of the process, provided the slag be entirely free from iron. Since it was possible to eliminate phosphorus down to minimum quantities in the open hearth or in the converter by overflowing, therefore the same quality of steel could be made in the electric furnace from impure raw materials, provided the last operations—the deoxidizing, the desulphurizing and the carbonizing—be carried out in the electric furnace.

The duplex process was therefore adopted. The entire oxidizing process was consigned to the ordinary furnaces, the dephosphorized material was transferred to the electric furnace, and it was only then that the greater part of the oxygen was removed by carbon and the process was carried to a close in the manner indicated. A peculiar method of carbonizing has been adopted in the electric furnace with the aid of carburite, a mixture of 50 per cent. of carbon and 50 per cent. of iron, which is so solid that it is not mechanically destroyed by the slag, nor crumbled by the heat, and is so heavy that it penetrates through the slag. This permits the carburizing to be done with extraordinary accuracy.

The process makes it possible to utilize the cheapest impure raw materials, even copper and arsenic having lost their terrors, since they are injurious only in the presence of sulphur. The steel is as thoroughly deoxidized as in the crucible furnace, without being affected like it by the character of the walls, and much larger quantities, uniform in composition, can be produced at a cost half that of crucible steel, or even less, under certain circumstances.

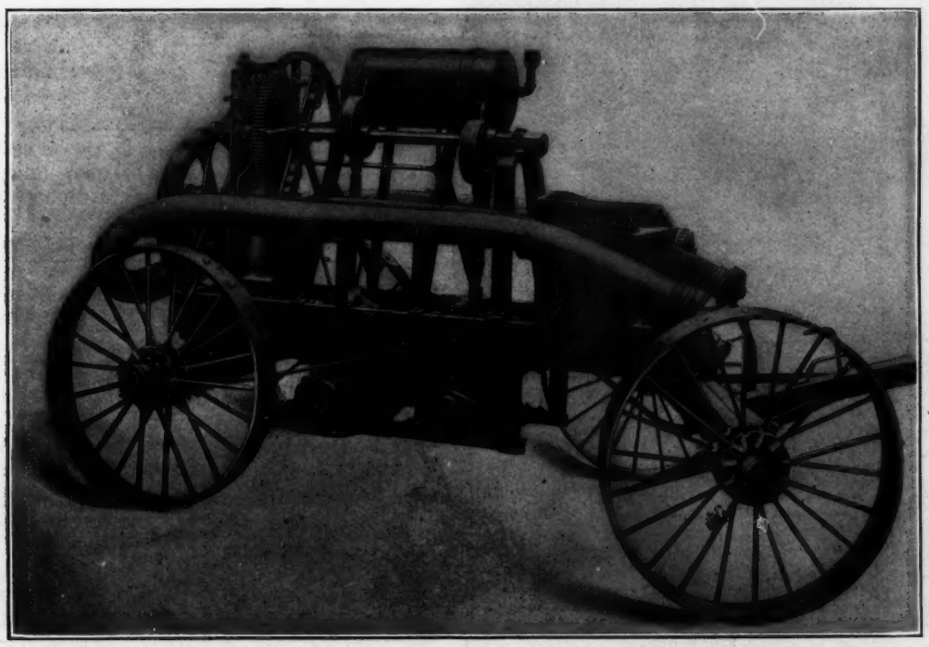
The Union Malleable Iron Company, East Moline, Ill., which shut down July 1 for three weeks for necessary repairs and some needed improvements, has resumed operations and is running 50 per cent. heavier than at this time last year. During the shutdown the plant was equipped with an industrial railroad for the economical handling of material, and a complete new equipment of 28 mills was installed in the hard milling department. The outlook for an increasing volume of business is very promising, as, in addition to the heavy specifications already entered, contracts are being renewed at a considerably increased tonnage. It is expected that by September 1 the plant will be running at full capacity.

The New York Central negotiations for 2500 box cars, which it is expected will be divided between two car companies, are to fill requirements noted some time ago. The Buffalo, Rochester & Pittsburgh has bought 500 steel underframe box cars and 1000 all-steel hopper cars. Of the Burlington requirements of 3000 cars, 500 refrigerator and 2000 box cars are reported to have been placed, while 500 steel gondola cars are said to be under negotiation.

A Portable Gasoline Engine Pumping Outfit.

A novel portable pumping outfit, upon which patents are pending, has recently been brought out by the Water Works Equipment Company, 50 Church street, New York City. The outfit consists primarily of a steel wagon truck with metal wheels having tires 5 in. wide, and provided with a drop tongue to which a team of horses may be attached. In the middle third of the bed and under slung, to keep the center of gravity low, are fixed two No. 4 Edson diaphragm trench pumps, each of a nominal capacity of 6000 gal. per hour. At the rear end of the bed is mounted a 5½-hp. Fairbanks vertical gasoline engine, and upon the inner end of the crankshaft is a pinion which meshes with a large gear wheel. The latter transmits the power of the engine to the pumps through a horizontal shaft, which operates the two eccentrics shown in the illustration. A tank is provided for holding cooling water for the engine and is held firmly in position in a frame of strap steel by a novel tightening device.

The battery for supplying current to the ignition apparatus of the engine is under the driver's seat, which



A Portable Gasoline Engine Driven Pumping Outfit Built by the Water Works Equipment Company, New York.

latter is made in box form and provides a convenient place for small tools. The wires are led from the battery to the engine through iron pipes which protect them from injury. Each outfit is provided with two 20-ft. lengths of suction hose complete, with couplings and strainers, and these when not in use are carried on side supports, as shown, being looped around back of the engine.

These pumping outfits will handle any quantity of water up to their capacity, containing sand, gravel or sewage which is liquid enough to flow, and they can be used for pumping sewers and for unwatering trenches, foundations, excavations or any other similar class of work. They give a much more efficient and reliable service than can be obtained by the use of hand pumps. With four men the maximum amount that can be pumped in 1 hr. with a No. 4 pump is 4000 gal. On a recent test, the results of which were by no means unusual, made at Trenton, N. J., in the presence of the city engineer and the superintendent of the water works, Alvin Bugbee, one of these outfits pumped 14,500 gal. per hour against an 18-ft. head. The test lasted for 5 hr. and the total amount of gasoline consumed by the engine was but 1½ gal. These pumps are capable of an extreme lift of 28 ft. The outfit as described weighs 3400 lb., and does not require an engineer nor other skilled labor to successfully operate it and keep it in order. These outfits have already been supplied to several water departments, among them being Trenton, N. J.; Portland, Ore.; Schenectady, N. Y., and numerous others have been ordered.

A modification of the outfit is now being constructed, having in addition to the pumping plant an air compressor driven by the same engine for operating two calking tools, two riveters and a baby rock drill.

The Lake Superior Mining Institute.

The fourteenth annual meeting of the Lake Superior Mining Institute will be held on the Marquette range, with headquarters at Ishpeming, Mich., August 25 to 28. For the trip over the Marquette range the itinerary is as follows: Wednesday, August 25, will be spent at Ishpeming, with business session in the evening. Thursday, August 26, at Negaunee, Marquette and Munising. Business session to be held at Munising. Friday, August 27, at Munising, Grand Island and the new mines in the Swanzy District, returning to Ishpeming in time to meet the south and west bound trains. Members desiring to go underground at Ishpeming on Saturday can make arrangements by applying to the secretary on Wednesday.

A partial list of the papers to be presented at the meeting is as follows: "How Reforestation May Be Applied to the Mine Timber Industry," by Thomas B. Wyman, Munising, Mich.; "Mine Accidents," by John T. Quine, Ishpeming, Mich.; "The Sociological Side of the Mining Industry," by W. H. Moulton, Ishpeming, Mich.; "Biographical Notes," by J. H. Hearding, Duluth, Minn.; "Reminiscences of the Early Days on the Marquette Range," by George P. Cummings, Marquette, Mich.; "Historical Sketch of Copper Mining on Lake Superior," by Alfred Meads, Marquette, Mich.; "Code of Mine Signals, Cleveland-Cliffs Iron Company," by O. D. McClure, Ishpeming, Mich.; "Capillary Attraction in Diamond Drill Test Tubes," by J. E. Jopling, Ishpeming, Mich.; "Sinking Reinforced Concrete Shafts through Quicksand," by Frederick W. Adgate, Chicago, Ill.

Among recent contracts for heavy electrical machinery taken by the Allis-Chalmers Company, Milwaukee, Wis., is one covering two three-phase 25-cycle, 6600-volt alternating current generators, with a combined capacity of 8000 kw., to be direct coupled to gas engines, in the power plant of the Carnegie Steel Company's Carrie furnaces, at Rankin, Pa. These are the largest machines ever built for service of this character.

A New Process of Making Chilled Car Wheels.

BY THOMAS D. WEST, CLEVELAND, OHIO.

At present considerable interest is being manifested in how far steel and wrought wheels may displace chilled cast iron car wheels. If the opportunities that exist to raise the standard of chilled wheels are improved there is no likelihood of cast iron wheels being abolished. The wrought and steel wheels are still largely in the experimental stage, but have already proved that they have their disadvantages as well as their advantages. Brakes are not as affective on them as on chilled wheels. Greater power is required to pull a train having wrought wheels, and wrought wheels can bend if a car runs off the track, making them unreliable when replaced on the tracks. A cast iron wheel never bends, it must break if overstrained, and can do no further damage.

Brake shoes are more likely to stick to wrought wheels than to chilled cast iron wheels. In braking, it is not wise to entirely stop the wheel's rotation, which gives the chilled wheel another advantage over the wrought wheel, for if the wheel slides on the track, not only is the rail worn, but a flat place is ground on the wheel, making it pound thereafter and sometimes sufficient to break the rails.

The writer has lately perfected a process of casting chilled wheels whereby perfectly round wheels, with an even depth of chill all around the tread, throat and flange are obtained. This process is patented and partially shown in Figs. 1, 3 and 7, and will be described later.

Defects of Present Chilled Wheels.

Very few of the wheels cast by the usual process have an even depth of chill all around the tread, throat and flange, such as is indicated at *a* and *b*, in Fig. 5. They are more likely to have an uneven depth of chill, something after the proportions seen at *c* and *d* and *s* and *t*, Fig. 6, and not infrequently where the depth of chill is ⅜ in. on one side, it is ¾ in. on the opposite side. This uneven depth of chill is usually more marked in the throat than in the tread and explains why some flanges break when, from the thickness, it would seem that some other parts of the wheels or the track work would be more likely to fail. An uneven depth of chill in the throat or through the line *s* and *t*, Fig. 6, is the most prolific cause of internal strains or weakness.

In a very large number of car wheels broken, after being taken from under the cars of one of the leading railroads, 70 per cent. showed variations in the depth of their chill. If the chill is uneven in thickness, the thin side will wear away faster than the thick side, not only making the wheel untrue, but weak. This is because the hardness cannot be uniform if the thickness of chill is not. Here then is another importance of an even depth of chill, for wheels that are not round initially or do not remain so, cause vibration that is not conductive to smooth running and track endurance.

Cause of the Defects.

The processes in use at the present time are not positive in producing perfectly round wheels. Some are so untrue that they have to be ground after being pressed on their axles, which produces nonuniform hardness of the tread, so that they are soon untrue again and often dangerous. The reason for the present common defects is that the contraction crust or chilled body is free to move in the line of least resistance during the solidification of the metal in the mold. To illustrate, imagine a wooden cylinder, *e*, Fig. 4, to be braced solidly in a tub of water, with supports at its outer body as at *f*, and the inside held by rubber bands *h* and *i* of different strengths. Upon removing the outer supports *f* the cylinder would move toward the strongest band. This in principle is what often takes place in casting car wheels, as can be judged by referring to Figs. 3 and 7. The car wheel *j* corresponds to the wooden cylinder, the chiller *k* to the outer braces *f* and the sand forming the mold, with several other factors that can vary in their pulling power, to the rubber bands. As soon as a wheel is poured, the chiller *k* creates a crust, that by reason of rapid cooling to a solid state contracts away from the chiller, as shown at *l*, Fig 7. This action is practically a removal of the braces *f*, Fig. 4, and leaves all the other factors that can in any way sway the crust to follow the line of least resistance. These may be a difference in the temper of the sand, variations in ramming, unequal spacing of cross-bars, molds not exactly level when poured, creases in the face of a chiller, and irregularities or fins at the joint of the nowel and chiller.

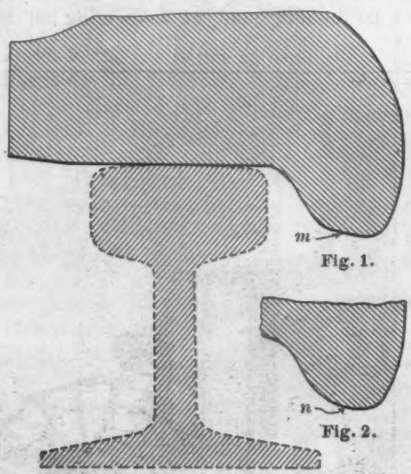


Fig. 1.

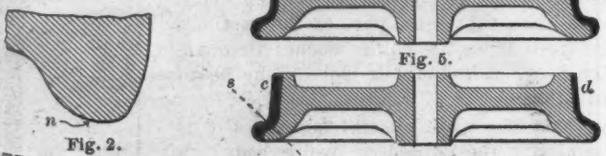


Fig. 4.

Fig. 5.

Fig. 2.

Fig. 6.

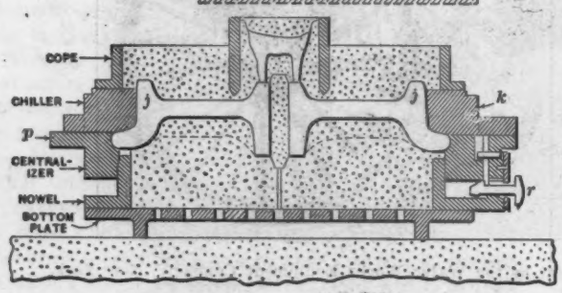


Fig. 3. The Mold just after being poured.

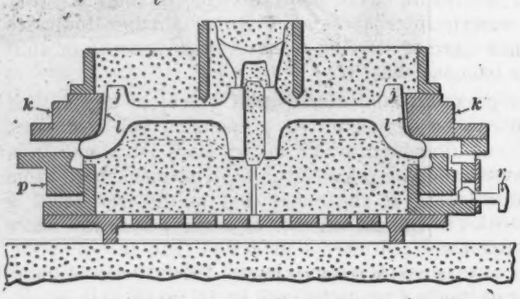


Fig. 7. Mold seven minutes after being poured.

A New Process of Making Chilled Car Wheels.

The West Process.

To demonstrate the practicability of the appliances used with the improved process seen in Figs. 3 and 7, a few wheels were cast at the Standard Car Wheel Company, Cleveland, Ohio, through the kindness of C. A. Brayton, Jr., general manager. It was discovered that the chill or crust contracted about ⅝ in. inside of 7 min. This means that the outer or chilled rim of a car wheel contracts nearly its full amount, while much of the internal body is still semi-liquid.

The writer's remedy for uneven chill is to cause the wheel while contracting to remain central in the mold, so that one part will not remain in contact with the chiller longer than any other. To accomplish this he uses the outer edge of a wheel's flange in connection with the top edge of the wheel's tread. As the latter may be considered unnecessary by many, it is not shown here. How the flange is utilized to obtain the ends sought will be seen from Figs. 1, 3 and 7. The centralizer *p* is of solid iron and of sufficient weight, so that when released by pulling out the keys *r* it will descend by gravity as fast as the contracting crust will permit it and compel the casting to leave the surface of the chiller uniformly. Thus there is obtained an even depth of chill and a true round wheel.

Fig 2 is shown for the purpose of illustrating, as at *n*, the form of the outer edge of car wheel flanges in use at the present time. At *m*, Fig 1, is the form used by the writer's process, and while it is slightly different, no objections have been presented to its use.

A chill will be deeper in a casting the longer the surface of the metal remains in close contact with the chiller, up to the limit of the possible effect of the chiller. If there is any other reason for an uneven depth of chill in wheels than that some part of the casting's surface becomes freed from the chiller sooner than another the writer does not know of it, nor has he heard any other explanation.

It is the gray part of a wheel's metal that gives it its best strength, and not the chilled or white body. A chilled or white iron contracts more than a gray iron, causing internal strains, which further indicates the importance of striving to have an even depth of chill in cast iron car wheels.

The great internal strain that exists in any chilled casting can be demonstrated by pouring two test bars, say 1¼ in. diameter by 12 in. or more long, one in a sand mold and the other in an all-iron mold, both from the same ladle. If the metal cast in the iron mold is all white as in the chilled face of a car wheel, the white bar will show much more contraction than the gray one, or that cast in the second mold.

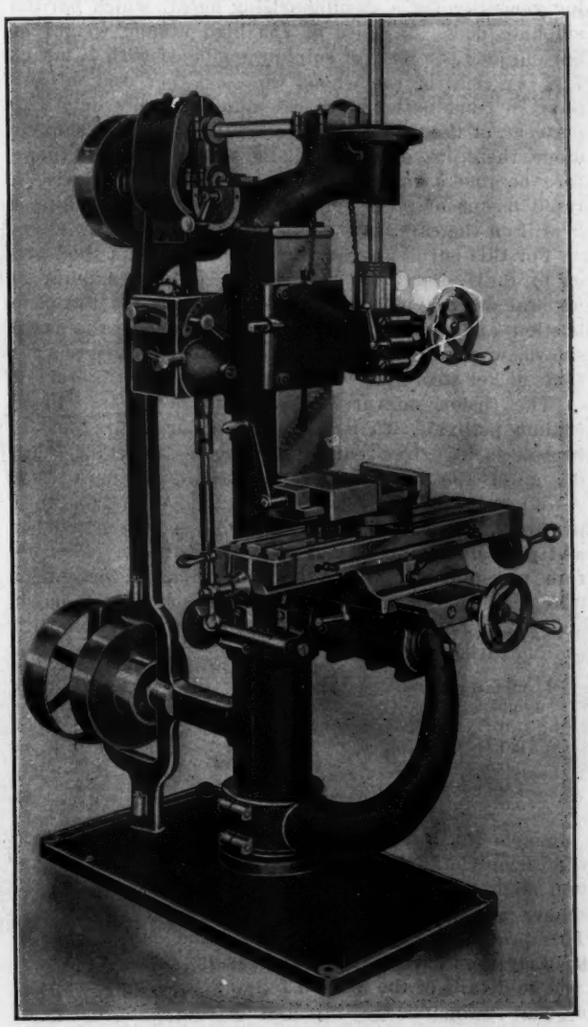
The writer has lately learned of an experiment, which he is not now free to divulge, that has proved almost inconceivably the great weakening influence of chilling an iron, and before long a new process may be introduced that will also be helpful in connection with the process above described to still further increase the safety and life of chilled car wheels.

In conclusion, it may be said that the cost of labor to mold and cast chilled wheels by the new process need be little if any more than for present processes. The cost of making the flask will be somewhat greater than that of those now in use, but this should be more than doubly offset by the preference which would be shown for the better product.

The Life of Electric Railroad Rails.—The question of rail life on electric roads came up for discussion at the annual convention of the Permanent Way Institution, which opened at Sheffield, England, July 17. Professor McWilliam of Sheffield University in presenting the topic spoke of the toughening effect of manganese and silicon upon steel. Referring to the corrugation of rails on electric roads, he considered it to be a mechanical effect of the mechanism running on the rail. All the metallurgist can do, he said, is to try to find something that will wear longer under the conditions of this service. Chief Engineer Willox of the Metropolitan Railway, London, said that on steam roads with the use of large wheels and springs the life of rails may be 25 years or more. However, with a low center of gravity, small wheels, the deal weights of motors and the extraordinary acceleration and deceleration, which are features of electric railroad service, the life of rails comes nearer being 25 months. He had found that rails rolled from steel to which silicon additions had been made had an increased life of about 110 per cent.

The No. 2 Knight Drilling and Milling Machine.

The first combined drilling and milling machine brought out by the W. B. Knight Machinery Company, St. Louis, Mo., proved so satisfactory for a great variety of light drill press and vertical miller work that the builder was led to design a much larger machine, having the same characteristics. This, the No. 2 Knight drilling and milling machine, is shown in the illustration and is capable of performing heavier operations of drilling, boring or milling, or two or more of these operations at a single setting of the work, thus saving time ordinarily lost in resetting work. Any one of the operations can be done at any angle in a vertical plane parallel with the face of the column, as the table can be tilted and quickly adjusted to any of the positions mentioned.



The No. 2 Drilling and Milling Machine Built by the W. B. Knight Machinery Company, St. Louis, Mo.

Special pains have been taken in the construction of the machine to make it very rigid, powerful and accurate, so that particular work can be turned out satisfactorily in the shortest time. The adjustments are quickly and easily made, and it is claimed that from 20 to 50 per cent. time saving is possible as compared with the usual machines for doing the same work.

Barium and Sulphur in Fluorspar.

BY HENRY G. MARTIN.*

The following article is reprinted from the *Journal of Industrial and Engineering Chemistry* for July, 1909:

The author has recently analyzed samples of fluorspar containing quantities up to 10 per cent. of barium sulphate. The presence of this impurity is a more reasonable cause for condemnation of the material than either high silica or high percentage of carbonates, for while the presence of the latter substances, by lowering the content of calcium fluoride, and thereby affecting the value of the material, gives legitimate cause for argument before paying the bill, neither one proves that bane to the open-hearth furnace manager, who is seeking generally for a desulphurizing agent, which barium sulphate does. Because of the high atomic weight of barium, one per cent. of sulphur combined with it means 7.28 per cent. of the whole, while one per cent. of sulphur in combination with calcium represents only 4.25 per cent. of the whole. The determination of the sulphur alone, therefore, does not tell the whole story. It therefore became a matter of first importance to devise a rapid means of properly valuing this material while it is still on the cars.

For this purpose recourse was had to the method given by S. W. Parr† for the determination of sulphur in mineral matter, using a Sundstrom bomb for the combustion and oxidation. The bomb, which is herewith shown, was made in our machine shop out of seven per cent. nickel steel and was heavily nickel-plated.

The fusion mixture recommended by Parr, 10 g. sodium peroxide, 0.5 g. potassium chlorate, and 0.5 g. benzoic acid, gives entire satisfaction, working with 0.5 g. of the material, as the results below testify. A mineral having a total sulphur value of 1.61 per cent., determined by fusion with sodium carbonate and potassium nitrate, and proper removal of silica before precipitation, and a barium sulphate content of 9.80 per cent. and 10 per cent., as found by the buyer and seller, respectively, also determined by fusion with sodium carbonate, was used:

Determination number.	Sulphur. Per cent.	Barium sulphate. Per cent.
1.0	1.68	9.90
2.0	1.58	10.10
3.0	1.56	9.88
4.0	...	9.84
5.0	...	9.60

Sample No. 5 had 1 g. of sodium carbonate added to the fusion charge, with the idea that perhaps some barium might become caustic, due to insufficient carbon to render all bases carbonates, and so soluble in water. This procedure evidently had no value, but neither is it likely that it caused the low result.

The details of the method follow:

The fusion charge is placed in the bomb, 0.5 g. of the mineral added and mixed by stirring, the bomb closed, after adjusting the fuse of soft iron wire, No. 31, and the latter fused with a 3.5 ampere current.

The bomb is placed in a copper dish filled with water and which is made one pole, a copper wire curved so as to have considerable spring, resting on the cover, being the other pole.

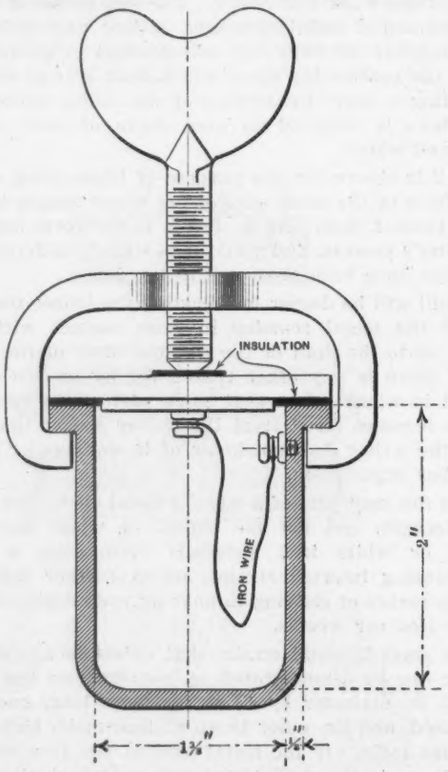
The explosion takes place very quietly. After a few minutes' cooling the melt is washed out into a beaker with hot water and placed on a steam table until the decomposition of the peroxide is effected, or it may be boiled, but here enters the objection to boiling an alkaline solution over a gas flame, due to contamination by sulphur in the gas. It is then filtered on pulp, the filtrate acidified with hydrochloric acid and the sulphur precipitated by adding barium chloride.

The filter, with the residue, is transferred to a beaker and sufficient dilute hydrochloric acid added to dissolve all mineral matter. The determination is then filtered from the paper and the barium precipitated by adding sulphuric acid.

The excess of sulphur over that required to form the barium sulphate is calculated to calcium sulphate, and so reported, and this amount of calcium afterwards deducted from that found later as calcium fluoride.

The determination of the remaining constituents of fluorspar is made as follows:

Five-tenths g. of the material is placed in a small beaker, moistened with water and 10 c. cm. acetic acid added (see *Chemical Engineer*, 3, No. 2). This is allowed to stand for some time on the steam table and is then diluted and brought to a boil, and filtered on an S. & S. 589 blue ribbon paper. From the filtrate, oxides of iron and aluminum, lime and magnesia are determined as in limestone, the latter two being calculated to and reported as the carbonates. Should there be evidence of lead in the spar, it may be separated by passing hydrogen sulphide previous to precipitation of the iron and aluminum.



The Sundstrom Bomb.

The residue from the acetic acid treatment is placed in a platinum crucible and after burning off the paper at a low heat is roasted for ten minutes in an ordinary Bunsen flame, and the weight registered. A few cubic centimeters hydrofluoric acid are then added and the crucible heated gently until contents are dry, then roasted again for ten minutes in the same flame as before. The difference in weights is considered silica. One c. cm. sulphuric acid is then added and gentle heat applied until the calcium fluoride has all been converted to the sulphate, the crucible cooled, hydrochloric acid added and the whole washed into a beaker of 150 c. cm. capacity and diluted somewhat. After boiling, if no barium or lead be present, there will be no undissolved residue; if there be a residue, it may generally be discarded here, after filtering. However, if so desired, ignite it and weigh as a check on the first barium determination, or if it contain lead dissolve in ammonium acetate and separate with hydrogen sulphide. Hydrogen sulphide may also be passed through the filtrate, but there will always be some platinum precipitated here, which should not be confused with lead. This filtrate is now ready for the determination of oxides, lime and magnesia. The oxides are added to the weight of those dissolved by acetic acid, the lime calculated to fluoride, after deducting such as may be required to form the

* Chemist of the Lukens Iron & Steel Company, Coatesville, Pa.

† Journal American Chemical Society, 30, 764.

calcium sulphate mentioned before, and the magnesium calculated to fluoride.

These manipulations are all on the order of the "rough and ready" kind, but without using them the average works chemist would never see the end of his day's work. No claim is made for the accuracy of the silica determination for all samples, but it has apparently given good results on all samples which have come under the author's notice. The two precipitations of barium sulphate are made in large bulk without reference to dissolved silica being present. All my results have checked closely with those obtained by fusion with sodium carbonate and removing silica by dehydrating and filtering previous to precipitation. Treating the barium sulphate with sulphuric acid and hydrofluoric acid, evaporation and ignition have failed to show the presence of any silica. If lead be determined, it should be calculated to the sulphide and the proper amount of sulphur deducted from that remaining after calculating barium sulphate, before calculating the remainder to calcium sulphate.

Should the mineral exhibit evidence of the presence of iron pyrite, it would be difficult to properly place all the sulphur, and a direct fluorine determination would be necessary unless one be willing to consider all the calcium, insoluble in acetic acid, as the fluoride, no sulphate being present.

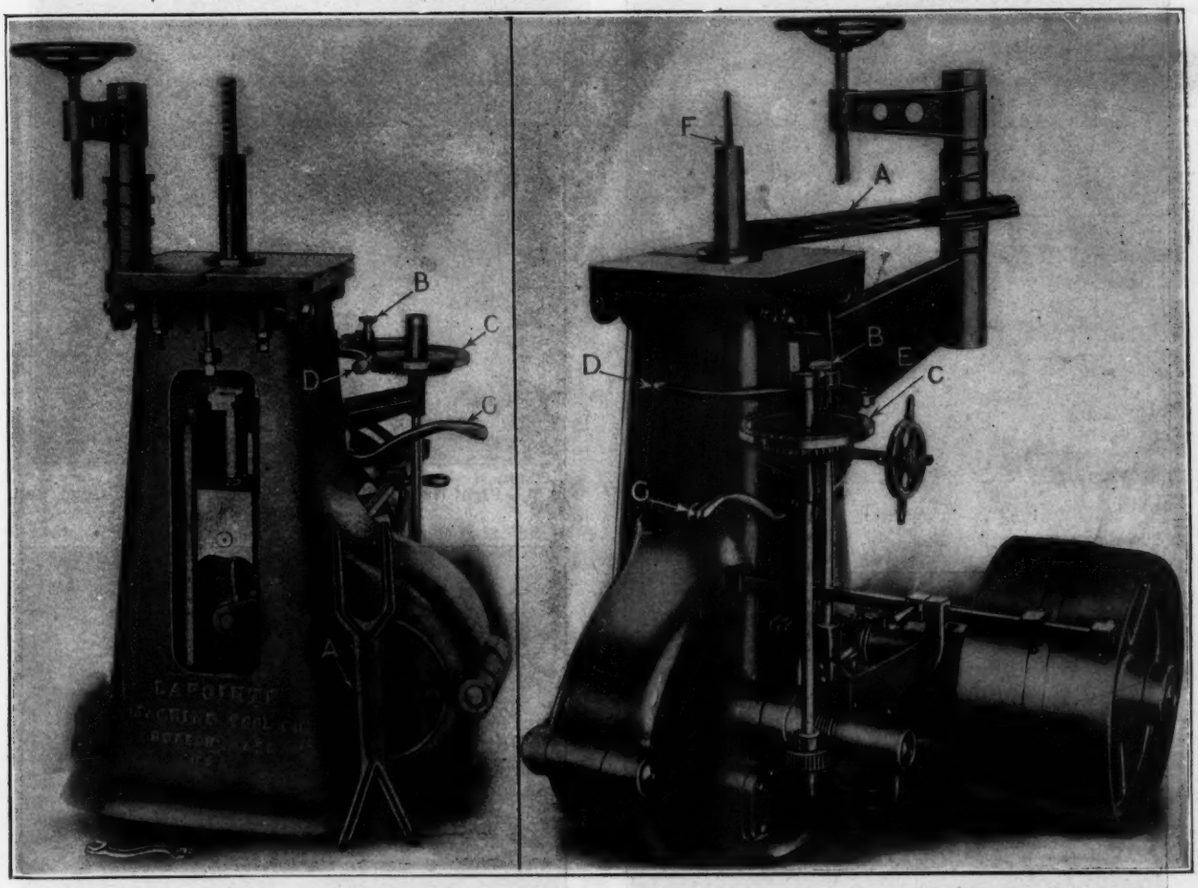
The whole scheme is offered merely as a means of quickly classifying a material which heretofore has required a long time for its proper analysis.

At the meeting of the British Foundrymen's Association, held at Birmingham, England, August 3 to 5, papers were read as follows: "Twenty-five Years of Cast Iron," by Prof. T. Turner; "The Production of Patterns for Light Castings," by W. H. Sherburn; "Influence of Chemical Compounds on the Properties of Cast Iron," by A. H. Hiorns; "The Application of Rule of Thumb and Science in the Foundry," by S. G. Smith; "Introduction to the Effect of Structure Upon the Physical Properties of Cast Iron," by F. J. Cook and G. Hailstone.

The Lapointe Vertical Keyseating Machine.

The machine illustrated, designed for general keyseating, is an adaptation of the broaching machine of its builder, the Lapointe Machine Tool Company, Hudson, Mass. It is entirely automatic in its feed, release for the cutter and stop for any required depth of keyway. The cutter is a broaching bar, with 10 teeth, each cutting its proportional part at each action of the bar; this arrangement reduces the number of strokes required to do the work, as compared to the use of a single cutter. The work is placed on a work bushing, fitting the hole in the work and fastened down by a clamping arm, one end of which rests on the work and the other on a post with steps for different hights of work, and is held down by a screw operated by a hand wheel.

A depth regulator, B, determines the depth to be cut. This is set in any one of the holes in the index plate C. The machine is started by the operating handle D. As the index plate revolves with the machine the finger of the regulator comes in contact with a roller on an arm, E, on the operating handle, stopping the machine. The index plate has a division of 40 holes, graduated for depth increments of 0.01 in. The cutter is fed by a wedge, F, sliding on the back of the bar, which is automatically advanced at every motion and automatically released upon its return by allowing the wedge to drop back half the distance of its advance. By this arrangement the cutter is released from rubbing on the work during its return. The movement of the wedge in advancing and returning half way is continued until the machine is automatically stopped at the required depth. At the end of an operation the feed key is returned to starting position by the handle C. The feeding may be done by hand if desired. The machine has tight and loose pulleys, so that it may be belted direct to a line shaft, requiring no countershaft. The loose pulley has a self-oiling bushing.



Two Views of the Vertical Keyseat Broaching Machine Built by the Lapointe Machine Tool Company, Hudson, Mass.

The Sarco Fuel Saving & Engineering Company, West Street Building, New York City, has brought out the first issue of its publication, known as *Sarco*, which is to appear about every two months, and will deal with

power plant practice. The purpose is to apprise power plant owners of the latest developments and applications of Sarco apparatus, and it will also deal with power plant operation, about half of each bulletin being devoted to general articles covering such subjects as the purchasing of coal and its combustion, apprenticeship systems for increasing the efficiency of power plant forces, the effect of design on operating expense, variation of costs with different load factors, the best systems of firing different grades of coal, proper operations of various types of grates and stokers, &c. Of such general articles there are in the first number two, one on the "Combustion of Coal," by Lewis Sanders of the General Engineering Company, New York City, and another on "Why Waste Coal?" which deals with the Sarco automatic combustion (CO_2) recorder, followed by an illustrated article on the method of operation, attendance, function, &c., of the Sarco recorder.

Fig. 1.—Lower Rail, Titanium.

Fig. 2.—Lower Rail, Standard Bessemer.

A Nine Months' Test of Titanium Steel Rails.

Reference has already been made in these columns (*The Iron Age*, April 29, page 1347) to the titanium steel rails laid on Kessler's Curve, Cumberland Division, Baltimore & Ohio Railroad. Twenty-four rails were put in service on this curve October 7, 1908. Of this number 17 were rolled from steel in the manufacture of which titanium alloy was used. The remaining seven were standard Bessemer rails. These rails were placed on both the high and low sides of this 9 degree curve, over which there is very heavy traffic. On July 8, 1909, or nine months after the laying of the 24 rails in question, photographs were taken, some of which are reproduced in connection with this article. It was found that the 17 titanium rails are still in good condition. When sufficiently worn down on one side it is the expectation to turn them and use them again. The seven standard

Fig. 3.—Right-Hand Rail, Standard Bessemer; Left-Hand Rail, Titanium.

Fig. 4.—Lower Left-Hand Rail, Standard Bessemer; Lower Right-Hand Rail, Titanium.

Bessemer rails were so worn in the nine months' service that they are about to be removed. Diagrams were obtained directly from the two classes of rails by R. W. Hunt & Co., engineers, New York and Chicago. These show that the loss by wear in pounds per yard was 294 per cent. greater for the Bessemer rails than for the titanium rails. The condition of the titanium rails points to a considerably longer life than they have already had in service. The data given above and the photographs from which the accompanying cuts, Figs 1 to 5, are made were

Fig. 5.—A Pair of Standard Bessemer Rails.

secured by the Titanium Alloy Manufacturing Company, of which Charles V. Slocum is special agent at Pittsburgh.

A Hoefer Tap Hobbing Machine.

A new type of drill press specially designed for the use of manufacturers of taps has been developed by the Hoefer Mfg. Company, Freeport, Ill. The tap blanks are inserted in the ends of the vertical spindles, as finished taps would be in a drill press used for tapping, and are then driven through dies bolted to the table beneath. Two dies are used in succession, one a roughing die and the other a finishing die.

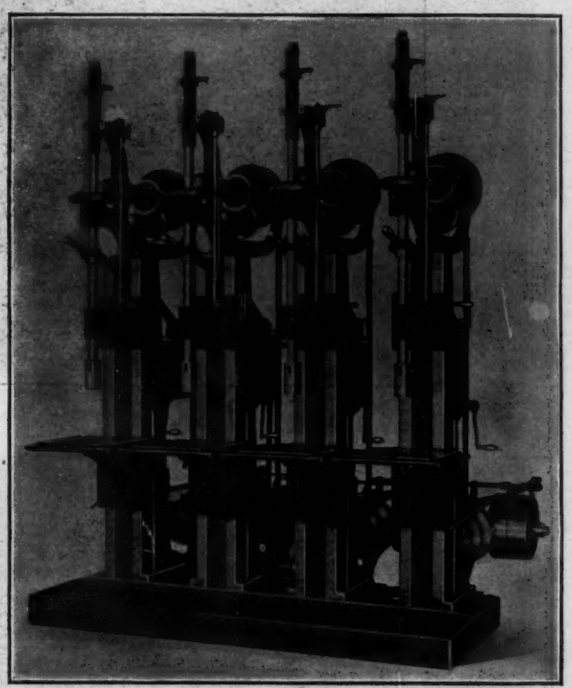
While the machine resembles, in many respects, an ordinary drill press, it differs notably in that the automatic feed is secured by a lead screw on the top of each spindle, which is extended through the crown gear for that purpose. The upper end of the spindle is turned down to a smaller diameter than the remainder and a threaded sleeve, serving as the lead screw, is fastened upon it by a lock-nut; this removable sleeve has the same lead as the tap which is to be threaded.

When the tap blank has been driven through the die it drops out and an adjustable tripping dog, clamped on and revolving with the threaded sleeve, throws out of mesh the nut which engages the sleeve, whereupon the spindle is returned automatically, by a counter-weight, to its original position and is ready to be supplied with another blank. The downward feed is thrown in again by the hand lever at the side of the lower spindle bearing.

The lower end of the spindle is fitted with a spindle head having the usual Morse taper and a special fixture for holding the square head of a tap blank. This spindle head is of further interest because of the special method employed for slotting it. Slots for drift pins are made usually by drilling three holes through the head and then cutting out the rest with a chisel. This frequently results, however, in getting the line of the drift hole off center, which prevents the drill seating centrally. In this machine the slots in the spindle head are milled out on a special machine having two milling cutters working from both sides at once. This results in an absolutely accurate and smoothly finished slot.

The machine has four spindles and therefore provides for two sets of dies. It is easily taken care of by one man. Each of the spindles is attached to a separate column and is equipped with its own independent driving mechanism, although all four columns are bolted to a common base plate. Inasmuch as hobbing tap blanks does not require a high speed, the back gears are left permanently in mesh, changes of speed being made by shifting the belt on the cone pulleys. Each lower cone pulley is driven at right angles from a shaft bearing a tight and loose pulley, and hence any spindle can be stopped independently of the others by the belt-shifting levers projecting through under the tables. Each table can also be lowered or raised independently of the others by a screw passing through a nut attached to the table and provided at its upper end with a bevel gear drive and crank.

The columns supporting the spindle heads and driving mechanism are of box type and substantial. The



A Four-Spindle Drill Type Machine Arranged for Threading Taps in Dies, Built by the Hoefer Mfg. Company, Freeport, Ill.

upper head is fitted with an additional back brace supporting the outer end of the cone pulley shaft for rigidity. One oil pump supplies oil to all four spindles, and drainage from the tables returns to the oil pan base, so that the oil can be used over and over.

The South Baltimore Car Works Sold.—The South Baltimore Steel Car & Foundry Company's plant at Curtis Bay, Md., has been sold at public auction by order of the court for $340,000 to William H. Grafflin, of Baltimore, representing the reorganization committee, which is composed of about 90 per cent. of the creditors of the corporation. The opinion is expressed that the plant is worth upward of $2,000,000. The reorganization committee, which will take over the plant if there is no unexpected hitch in the ratification, is composed of Mr. Grafflin, chairman; George L. Street, of Richmond; John F. Miller, of Wilmerding, Pa.; F. M. Campbell, of Philadelphia; J. H. Schoenly, of Philadelphia; E. B. Hunting, of Baltimore, and E. P. Gill, of Baltimore. The works can turn out 50 steel cars a day on a rush order, and can maintain an average output of 35 to 40 cars a day. When the plant is running full time 2,500 men are employed. At present about 900 men are at work.

Vulcan Electric Shovels.

For digging rock in the limestone quarries of the Dolese & Shepard Company, Chicago, Ill., two of the largest electrically operated power shovels ever constructed are being used. These are 110-ton machines, with buckets of 4 cu. yd. capacity, and in general design are similar to the steam shovels made by the same builder, the Vulcan Steam Shovel Company, Toledo, Ohio. Principally they are unique because electric drive has been applied and in a service where its design is something of a problem. In a shovel at work the load may suddenly vary over a wide range. If a steam engine is overloaded even to a standstill nothing serious results, but if an electric motor is suddenly stopped by an excessive overload it is in danger of being burned out. For these machines, however, special automatic means have been employed to safeguard the machinery without interrupting continuous operation, as would result with simple circuit breakers. These devices and all of the automatic control and the motors were furnished by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

A general view of one of these machines is given in Fig. 1. The hoist movement is actuated by a 200-hp.

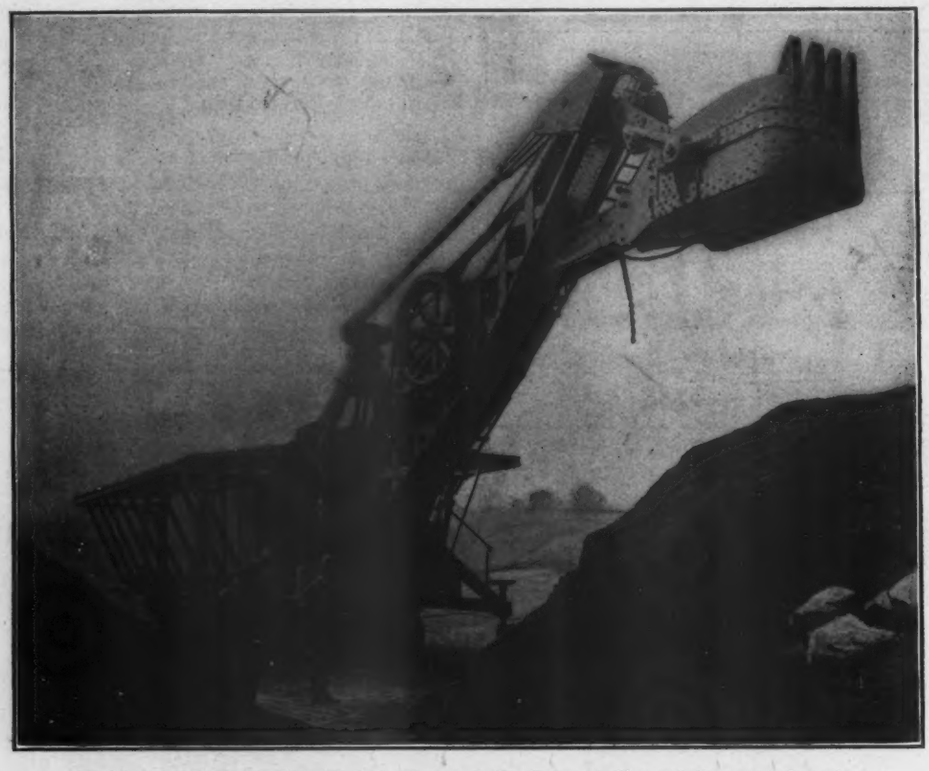


Fig. 1.—A 110-Ton Vulcan Electric Shovel at the Dolese & Shepard Company Quarries.

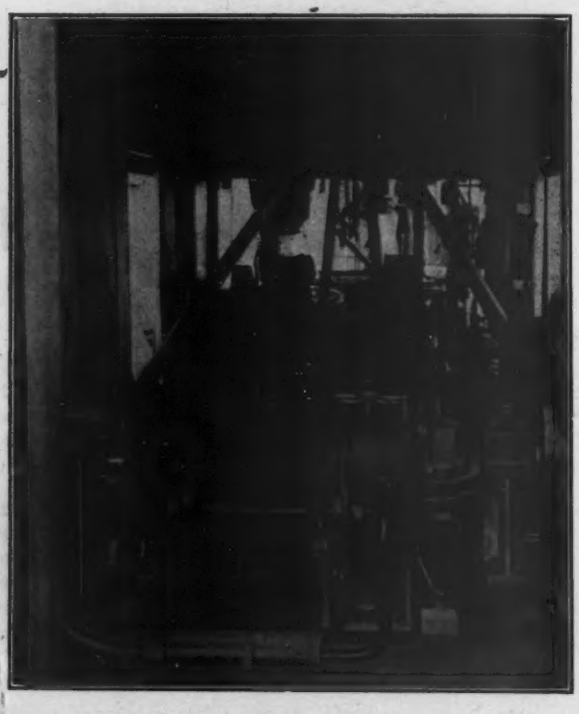


Fig. 2.—A View in the Cab, Showing the Westinghouse Hoist and Boom Motors.

220-volt series wound direct current type M. T. mill motor, running at 415 rev. per min.; the thrust motor, controlling the movement of the dipper handle, is an 80-hp. machine of similar type, while the boom swing is operated by an 80-hp. motor. The motors are controlled independently by type A automatic magnetic switch controllers, which, it is stated, enable the heavy bucket to be operated with celerity and exactness. This form of control protects the motors from any heavy overloads which might result from the bucket striking solid rock or other obstructions, by opening switches to introduce resistance into the motor circuit. The control panels and resistances are mounted in the rear of the cab, while the controller handles are conveniently placed near the hands of the operators.

The hoist and swing boom motors are mounted within the cab, as shown in Fig. 2; the 200-hp. hoist motor is to be seen in the foreground. The thrust motor is placed out on the boom, communicating motion to the bucket staff through reducing gearing connected to a pinion engaging a rack on the staff. The power circuit to the shovel is completed through a feed cable, carried on a retractile reel on the shovel cab, and through the rails on which the shovel advances. The shovel may also be fitted with a standard trolley for deriving power and for propulsion on ordinary electrified track. The machine may then attain a speed of 5 miles an hour.

Compared with the steam shovel, the electrically driven excavating apparatus has been found to present marked advantages of simplicity, economy and ease of operation. The hauling of water and coal is avoided, fewer operators are required to handle the machine, and a considerable saving of time is effected. For example, the cost of operating a certain electric shovel with 75-hp. hoist, 30-hp. thrust and 30-hp. swing boom is 1.64 cents per cubic yard of gravel, clay and sand, while similar work performed by steam shovels, it is claimed, would cost from 3 to 4 cents per cubic yard.

The Besly No. 26 Double Spiral Disk Grinder.

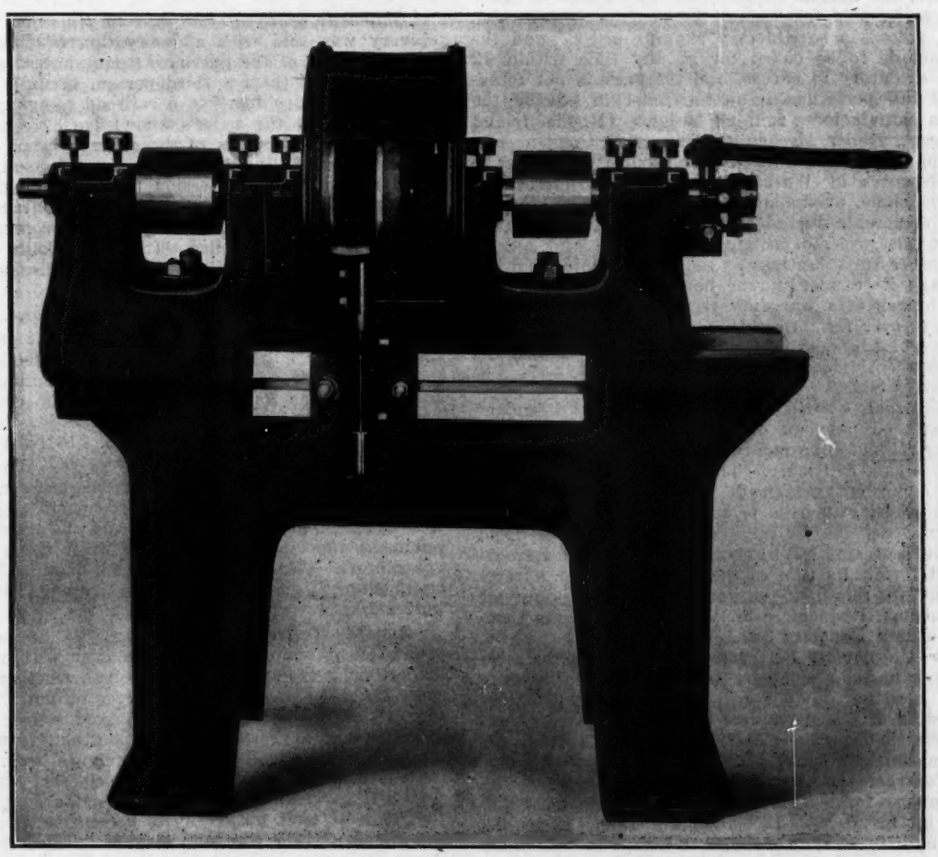
Power, strength, rigidity and accuracy are claimed to be characteristics of the No. 26 double spiral disk grinder manufactured by Charles H. Besly & Co., 15 South Clinton street, Chicago, Ill., at their Beloit (Wis.) works. The bed of the machine, which is 20 x 44 in. on the floor and 12 x 52 in. under the heads, is cast in one piece and is provided with a T-slotted pad in front to carry the work rest carriage. The heads are carefully fitted to the top of the bed casting and are also bored and reamed to receive the bearing bushings or liners. The caps over the bearings are removable. The bearing bushings are made in halves, with the exception of the long rack or lever bearing on the right end of the machine. This bearing is 10½ in. long. The bearing bushings in the sliding head are 7⅜ and 10½ in. long, and those in the stationary head are each 7 in. long. End thrust is taken on hardened and ground collars of large area, and ample provision is made for taking up wear. Lubrication of the grinder is stated to have been well taken care of.

It will be noticed from the illustration that the telescopic dust hood almost entirely incloses the disk wheels, which are 18 in. in diameter by ⅝ in. thick, and have a maximum opening between them of 10½ in. Because of the telescopic feature this opening is never any wider than the pieces being ground. The top hood is hinged and can be thrown back instantly, giving free access to the disk wheels. There is an opening just below the wheels for attaching a 5-in. exhaust pipe.

This machine is so arranged that a third wheel and rocker shaft can be attached to the left end of the machine at any time. On this shaft can be mounted either a geared lever feed table or a swinging or tilting table. The complete equipment of the grinder consists of a countershaft, swinging top, floor setting up press, all accessories, including two extra 18-in. spiral grooved steel disk wheels, making four 18-in. disks in all; Helmet cement, oil, glue pot and brush, wrenches, &c.; a complete assortment of Helmet spiral paper and cloth circles, and seven work rests, varying in width from 7-16 in. to and including 2 7-16 in. The countershaft requires a ceiling space of 20 x 68 in. and runs at 618 rev. per min., driving the machine at 1650 rev. per min., which is the speed for the 18-in. disk wheels. The shaft is 1¾ in. in diameter and 65⅝ in. long.

The patented mechanism for moving the sliding spindle gives a leverage of 20 to 1. The length of this spindle is 25¾ in. and the stationary spindle 22¾ in. The spindles are 1½ in. in diameter in the bearings and are made from crucible machinery steel. The length of the stationary head is 17¾ in., and the sliding head 18⅝ in. The spindle pulley is 6 in. in diameter by 5¼ in face; the driving and drum pulleys 16 in. in diameter for 5-in. belt; the tight and loose pulleys 10 in. in diameter for 8-in. belt, and the loose pulley bearing, which is oiled from the end of the shaft, is 10 in. long.

The operating floor space of the swing top press for 18-in. disks is 5 x 5 ft.; the base of the press is 16 in. in diameter. The operating floor space of the grinder is 5 x 10 ft., and the hight from the floor to the center of the spindles is 42 in. The weight of the machine complete with the countershaft is about 2100 lb. All screws used in these grinders have U. S. standard threads and are case hardened.



The No. 26 Double-Spiral Disk Grinder Built by Charles H. Besly & Co., Chicago, Ill.

A Self-Starting Gas Engine.—A four-cycle internal combustion engine which is self-starting without the aid of outside means is the invention of an engineer named Herman Dock. While compressed air is used, it is not its direct pressure upon the piston that effects the starting. The compressed air is forced through the carbureter to carry an explosive mixture into the manifold connecting the cylinders. Until actuated by the cam shaft the inlet valves remain seated under pressure due to the greater area of a balancing piston on the valve stem. After the start produced by exploding the compressed mixture the compressed air is cut off and the pressure in the manifold becomes again atmospheric. Thereupon the check valve opens and the engine operates in the ordinary way. A mechanical feature of the engine that is a departure is the connection of the piston and rod by a cup joint instead of the usual wrist pin. As a consequence the piston floats—that is, is free to rotate with respect to the axis of the rod, which has the effect of making the wear more uniform.

Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

Conditional Sales—Necessity for Filing Contract.—A condition in a contract of sale, whereby the title is to remain in the seller until the full amount of the contract price is paid, is void as against purchasers and judgment creditors of the purchaser in actual possession, unless reduced to writing, signed by the purchaser, and a copy thereof filed with the County Clerk or Register of Deeds of the proper county. (Supreme Court of Nebraska, Racine-Sattley Company *vs.* Hansen, 121 Northwestern Reporter 573.)

Sales—Estoppel.—The fact that the buyer under a contract for the sale of tanks for a lump sum received them with knowledge that the seller claimed that the sum was fixed for each tank does not estop him from insisting upon the contract price. (Iowa Supreme Court, W. E. Caldwell Company *vs.* Steckel & Son, 121 Northwestern Reporter 376.)

Contract of Sale Construed.—A contract for the sale of two machines, the first to be delivered within two or three weeks, and to be paid for "when the machine is delivered, set up and placed in satisfactory running order," and the "second machine to be called for at any time within 12 months," is executory in nature, and the price is not recoverable until full performance by the seller in placing the machines in satisfactory running order. (Rhode Island Supreme Court, Keller Mechanical Engraving Company *vs.* Kinney Company, 72 Atlantic Reporter 865.)

Sales—Breaches of Warranty—Rights of Buyer.—The buyer of a machine, on finding that it is not as warranted, may refuse to accept, rescind the sale and recover what he has paid on the price, or retain the machine and set off against the price such damages as naturally result from the breach, though he cannot pursue both remedies simultaneously. On breach of a warranty respecting a machine, the buyer could recover freight paid on it from the seller's factory to the point of destination. (Washington Supreme Court, Houser & Haines Mfg. Company *vs.* McKay, 101 Pacific Reporter 894.)

Sales—Contract Construed.—Plaintiff leased defendant a steam shovel on payment of a fixed sum, agreeing that after the payment of nine monthly rentals defendant might purchase by paying $10 more. The shovel proving unsatisfactory, an agreement was made whereby plaintiff should ship another shovel at a fixed price, part to be paid in cash and the balance by the delivery of the first shovel. Held that the failure of plaintiff to comply with the second contract did not forfeit its title to the first shovel nor authorize defendant to retain it without payment. (Supreme Court of Alabama, Roquemore *vs.* Vulcan Iron Works Company, 49 Southern Reporter 389.)

Contracts—Incomplete Performance.—A contractor seeking to recover under a contract to furnish and install a steam boiler need not produce evidence tending to show the reasonable value of his incomplete but substantial performance. (Wisconsin Supreme Court, Mueller *vs.* Burton, 121 Northwestern Reporter 152.)

Power Contracts—Payment—Mistakes.—A contract required a company to furnish electrical power amounting to at least 350 hp. for at least 12 hr. per day during every day of the year, and bound the consumer to accept the minimum amount and to pay at the rate of $20 per horsepower per year of 365 days of 12 hr. each, and at the same rate for every hour over 12. The consumer received at least the minimum amount 12 hr. or more in every day of the year, but the power had been intermittent. As a matter of fact, power was furnished for more than 12 hr. daily. Held, that computing compensation at the rate of $20 per horsepower per year of 340 days of 10 hr. each, instead of 365 days of 12 hr. each, was erroneous, resulting in overpayment. The consumer's agent, who erroneously computed the compensation resulting in the overcharge, was authorized to measure the power and compute the price, but only according to the contract price. The consumer did not consent to nor ratify the agent's act and repudiated the same on ascertaining the facts. Held that he was entitled to recover the overpayment as money paid under a mistake of fact. The burden of proving that it would be unjust to require repayment of money paid under a mistake of fact rests on the party resisting repayment. (New York Supreme Court, Appellate Division, Third Department, Payne *vs.* Witherbee, Sherman & Co., 117 New York Supplement 15.)

Estoppel—Attorneys—Corporations—Authority of Officers—Bankruptcy.—The true owner of personal property may be estopped by his acts and declarations from asserting his title as against a purchaser from one having no title. Plaintiff's attorney, in an action to recover possession of personal property, was not authorized to disclaim plaintiff's title to the property at a bankruptcy sale thereof as belonging to one to whom defendant turned it over after plaintiff's judgment for possession was rendered, and hence his declarations were not admissible in evidence to affect plaintiff's title. The authority of the general manager of a corporation depends largely upon the particular facts of each case, considered in view of the general principle that his implied authority is limited to those things which are incidental to the usual corporate business or to that branch of it intrusted to his management. The general manager of a corporation had no authority, by reason of his position, in the absence of any showing of special authority, to disclaim the corporation's right and title to property at a bankruptcy sale of the property as belonging to one to whom defendant turned it over after judgment for possession was rendered for the corporation. A purchaser at a sale in a bankruptcy proceeding is chargeable with notice that nothing is sold except the bankrupt's interest, and a purchaser at a sale under an execution is chargeable with notice that nothing is sold but the interest of the defendant in execution. (North Carolina Supreme Court, Asheville Supply & Foundry Company *vs.* Machin, 64 Southeastern Reporter 887.)

Right to Countermand Orders.—It was too late for defendant to countermand his order given plaintiff for an implement to be manufactured, where the party with whom plaintiff, the seller, placed the order had commenced its construction before the countermand. (Louisiana Supreme Court, Loyd Mercantile Company, Ltd., *vs.* Long, 49 Southern Reporter 520.)

Shipment of Freight—Right to Hold for Charges.—Machinery was sold with a reservation of title in the seller until payment of the purchase money notes, and before payment of all of them a third person, lawfully in possession, delivered the machinery to a railroad company for transportation, without the seller's knowledge or consent, the company being ignorant as to the seller's claim. Held that on the consignee failing to call for the shipment, the company could not withhold possession thereof from the seller until payment of the freight and demurrage charges, since a person cannot be divested of his personal property without his consent, express or implied. (Supreme Court of Mississippi, Corinth Engine & Boiler Works *vs.* Mississippi Railroad Company, 49 Southern Reporter 261.)

Sales—Suit for Purchase Price—Defense.—In an action for the price of a boiler, work in setting it on a foundation and erecting a chimney "suitable for the boiler," defendant may counterclaim for the expense of extending the chimney to put it in the condition required by the contract. (New York Supreme Court, Appellate Division, Second Department, Logan Iron Works *vs.* Klein, 116 N. Y. Supp. 333.)

Contracts—Delays—Mutual Default.—Where delays in constructing an ice plant and refrigerating machines were caused by the mutual default of the parties, contract penalties will be regarded as waived, and the court will not attempt to apportion the delays between the owner and the contractor. (United States Circuit Court, Northern District, West Virginia, Filter Mfg. Company, 168 Federal Reporter 1002.)

Agents—Notice—Notes.—Notice to an agent in the course of his employment in a matter within the scope of his authority is notice to his principal, whether he communicates his knowledge to his employer or not. An agent authorized to sell personal property and collect the purchase money under a printed form of contract, furnished him by his principal, which contains a clause warranting for a limited time the quality of the article sold and binding the principal to make the article good or to supply another in the place of it if notice of its defects be given within the time named in the contract, may be notified that the article is not as it was warranted to be, and such notice to him is notice to his principal. If an agent who is authorized to sell and collect takes from the purchaser a negotiable note payable to himself and before it is due, and without consideration indorses it over to his principal, the principal takes it subject to the conditions made within the scope of the agent's employment, affecting its execution. Such assignment will not defeat the maker's equities. (West Virginia Supreme Court of Appeals, Buckeye Saw Mfg. Company *vs.* Rutherford, 64 S. E. Rep. 444.)

Mechanics' Liens—Right to Lien.—The foundation of a mechanic's lien is the contract with the owner of land for the improvement thereof and the furnishing of material and labor according to the contract, in connection with the statute giving the lien. The owner of premises which are not described in a contract for the improvement thereof cannot defeat a subcontractor's mechanic's lien as against a lot properly described in the claim for lien merely because the claimant omitted, through mistake, to include another lot upon which the lien might have been perfected. (Illinois Supreme Court, Granquist *vs.* Western Tube Company, 88 Northeastern Reporter 468.)

Building Material—Sales—Estoppel.—The legal title to iron railing for use in a building was in the contractor who abandoned the work after the railing had been delivered and while indebted to the seller of the materials. The cost of the railing had been included in an estimate of materials furnished, which the owner paid to the seller and charged to the contractor's account, with the latter's consent. The seller subsequently took the railing from the owner's premises on a distinct understanding that it was to be returned and put on the building, the owner having claimed the rail-

ing as his property. Held that the seller was estopped from denying the owner's right to possession and from asserting his own. One who by his statements as to matters of fact, or as to his intended abandonment of existing rights, designedly induces another to change his conduct or alter his condition in reliance upon them is estopped from denying the truth of his statements or from enforcing his rights against his declared intention of abandonment. (Alabama Supreme Court, Richards *vs.* Shepherd, 49 Southern Reporter 251.)

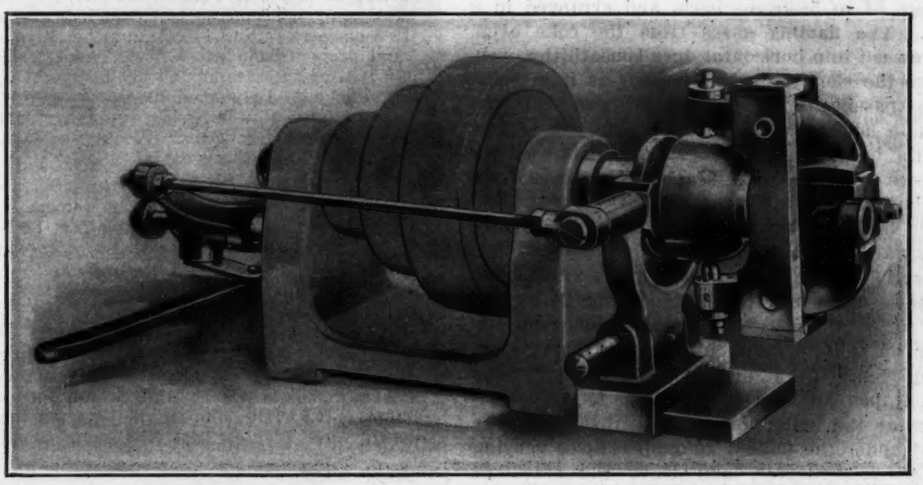
Fire Insurance—Effect of Policy Provisions.—Where a policy of fire insurance makes it a condition precedent that, in case of disagreement as to the amount of loss, it shall be determined by appraisement, the insured may bring suit on the policy, averring in his petition the performance of all conditions on his part; and when the insurer pleads in his answer the disagreement and the determination of the amount by appraisement, and the provisions of the policy as to concurrent insurance, the amount the plaintiff can recover is limited to a proportionate amount of the loss so determined and he cannot recover a larger amount, unless the appraisement is void or is set aside. If it is void, he may plead the invalidity in his reply; but if it is only voidable, he should in his petition unite a cause of action to set it aside. (Ohio Supreme Court, Royal Insurance Company *vs.* Ries, 88 Northeastern Reporter 638.)

Bankruptcy—Claims—Priorities.—Claims proved against the estate of a bankrupt, which from their nature are entitled to priority under a State statute, may be allowed such priority, although not claimed until more than a year after the date of the adjudication, when the question of distribution of the assets first arises. While the Bankruptcy Act provides that creditors holding claims which have priorities shall not, in respect to such claims, be entitled to vote at creditors' meetings, the fact that such a creditor does vote on the election of a trustee by inadvertence or mistake is not a waiver of his right to a priority; nor does it estop him from claiming the same, where no other creditor has been prejudiced thereby. (United States Circuit Court of Appeals, Sixth Circuit, in re Ashland Steel Company, 168 Federal Reporter 679.)

The Cleveland Automatic Two-Jaw Chuck.

As a substitute for the old style box chuck for use on brass and iron working machinery, the Cleveland Chuck Company, 514 Garfield Building, Cleveland, Ohio, has brought out an automatic two-jaw chuck. It is mechanically operated, but accomplishes the same thing as an air chuck, saving the expense of installing and maintaining an air system if there does not happen to be one already available. Three different methods of accomplishing the mechanical operation are employed in what are respectively known as styles A, B and C. The illustration shows the style B and suffices to show the general principle of the operation of the chuck proper.

The operating jaws are of cast steel and are carefully fitted in the chuck body and held positively and centrally by a hardened and ground center pin screw, so that the accuracy of the action is insured. It is claimed that the jaws will still be true after prolonged use, because there is no half screw thread to wear out of a right and left hand screw, such as is used on the ordinary two-jaw chuck. The action of gripping is accomplished entirely by the rocking movement of the jaws effected through the spreading of their rear ends by the axial movement of a conical or hemispheroidal collar. In dove-tailed slots in the front ends of the jaws, slip or clamping jaws of the same type as those used in present box chucks are inserted. These are interchangeable, so that the adapting of the device to a change of work is very quickly made. One pair of jaws is required for every different piece of work, but variations in the same pattern of not more than 1-16 in. require no readjustment of the chuck. The special feature of the chuck is the cushion plunger, which is placed on the rear end of the operating jaws. With this new device the adjustment is made for different size castings, and after being set properly for the first casting or piece to be machined, the cushion plunger will adjust itself automatically to all pieces if the variation is not greater than 1-16 in. This device acts also as a protection for the walls of castings or pieces being machined, which, if they happen to be thin, are saved from injury or crushing by the yielding of the cushion plunger. A particular advantage of the construction of this chuck is that there is no danger of its being made inoperative by chips or dirt getting into the working parts. The chuck opens wide enough to drop any article which it may have been holding, without the aid of the operator's right hand, and he can therefore in the meantime hold another piece ready to be gripped.



The Style B Automatic Two-Jaw Chuck Made by the Cleveland Chuck Company, Cleveland, Ohio.

The illustration shows the manner of operating the style B chuck, which has the advantage of leaving the spindle open, so that with the proper jaws the machine may be used for handling collet work. It is particularly useful where the shop is not equipped with automatic machines, as an ordinary lathe equipped with this chuck is capable of doing much of the work of such machines. The style A chuck differs only in the connections from the operating lever to the chuck, which is made through the hollow spindle in connection with the same lever arrangement as is used for ordinary spring collets. The style C chuck has the operating lever mounted directly on the rock shaft of the chuck-operating yoke. It saves the use of auxiliary mechanism at the outer end of the headstock and is particularly adapted for use on a plain-head turret or solid spindle lathes.

It is claimed that these automatic chucks will increase the output from 50 to 100 per cent. over the old style box chuck. The chucks are suitable for machines of from 10 in. swing up, and will hold work up to 3 in. in diameter. With the chucks are furnished one set of blank cast iron slip jaws, or jaws conforming to the work to be done will be furnished if samples are submitted. On special order the company also makes chucks of larger capacities than those mentioned above.

The Lukens Iron & Steel Company, Coatesville, Pa., is now running to full capacity. Its output for a recent week was the third largest for any week in the history of the company.

Under-Flue Coke Plant at Dawson, New Mexico.

A paper by J. E. Sheridan, Silver City, New Mexico, on the "Coal Mines and Plant of the Stag Canyon Fuel Company, Dawson, New Mexico," appeared in the June *Bulletin* of the American Institute of Mining Engineers. This company, of which James Douglas is president, operates mines in the Southern end of the Raton coal field, which extends north into Colorado and embraces many coal camps of the Trinidad section. The portion of the paper devoted to the coke ovens at Dawson is interesting, since they are provided with under flues which result in evident economy in production. We reproduce below the brief description of these ovens, together with the diagrams showing the details of construction:

The washed slack is hauled from the storage-tanks to the coke-ovens by two Scott-Dale electric larries, each pulling one trailer. There are 570 coke-ovens in operation: 124 beehive ovens, 13 ft. in diameter, and 446 English under-flue ovens, 11 ft. in diameter. Each oven is charged with 6 tons of slack, burns 48 hr., and produces 52 per cent. in weight of coke. The under-flue ovens are an innovation along economical lines, due to the activity of Dr. Douglas. These ovens are in batteries of from 54 to 58 ovens each, and arranged in a double row. The flaming gases from the coke oven, passing downward into horizontal flues beneath the oven, serve to coke the slack from the bottom as it is being coked on top, passing thence through an opening in the rear to a main horizontal flue between the two strings of ovens to the boiler houses, where the heat is used for steam purposes. The residual heat and gas pass from the boilers through two brick stacks, 125 ft. in hight and 11 ft. in diameter at the top. Details of the construction of these ovens are given in Fig 1.

A cross-section of the central flue which conducts the gases from the ovens to the boiler-plant (Fig. 2) has an area of 20.6 sq. ft. at the twenty-seventh oven, which is farthest from the boiler plant or chimney, and increases as other ovens discharge into it, until at the down cast to the boiler plant it has an area of 52.73 sq. feet. Pyrometer readings at the boiler-houses show that the gases are delivered under the boilers at temperatures varying from 1800 to 2600 degree, and leave the stack at temperatures of from 600 to 1150 degree F. At present the heated gases from only 218 ovens of the 446 under-flue ovens are being utilized, the return from the other 228 ovens being allowed to pass off through chimneys. Here are vast reserves of power that can be utilized to increase the capacity of the power plant as the mines increase in extent and production. There is one Covington coke-puller in use at the coke-ovens, electrically driven by two General Electric motors, one of 20 hp. and the other of 17.5 hp. It is probable that another coke-puller will soon be in commission.

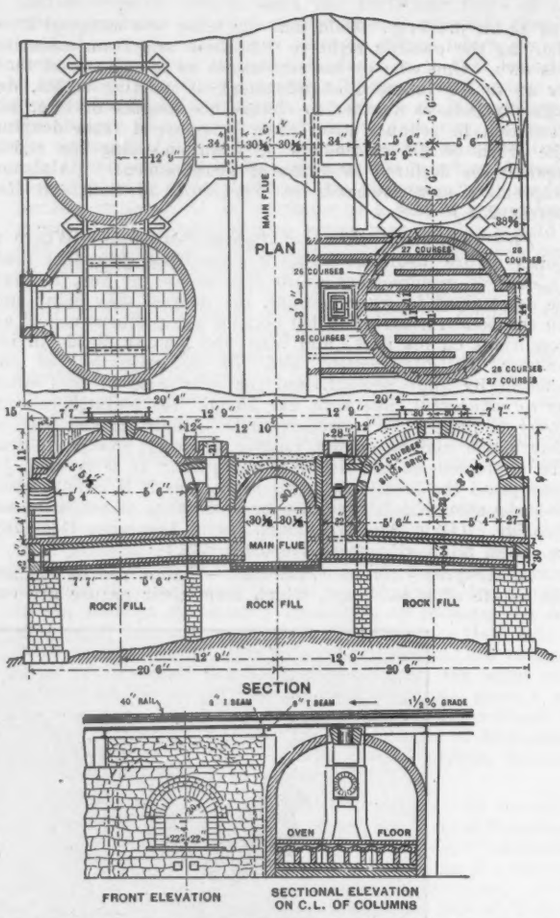


Fig. 1.—Plan, Section and Elevations of Main Flue and Under Flues of Coke Ovens.

A good quality of fire clay has recently been discovered near the coke-ovens. Bricks made from it have stood severe tests at high temperatures. A brick plant has been ordered which will supply all the firebrick needed for the coke-ovens and other purposes.

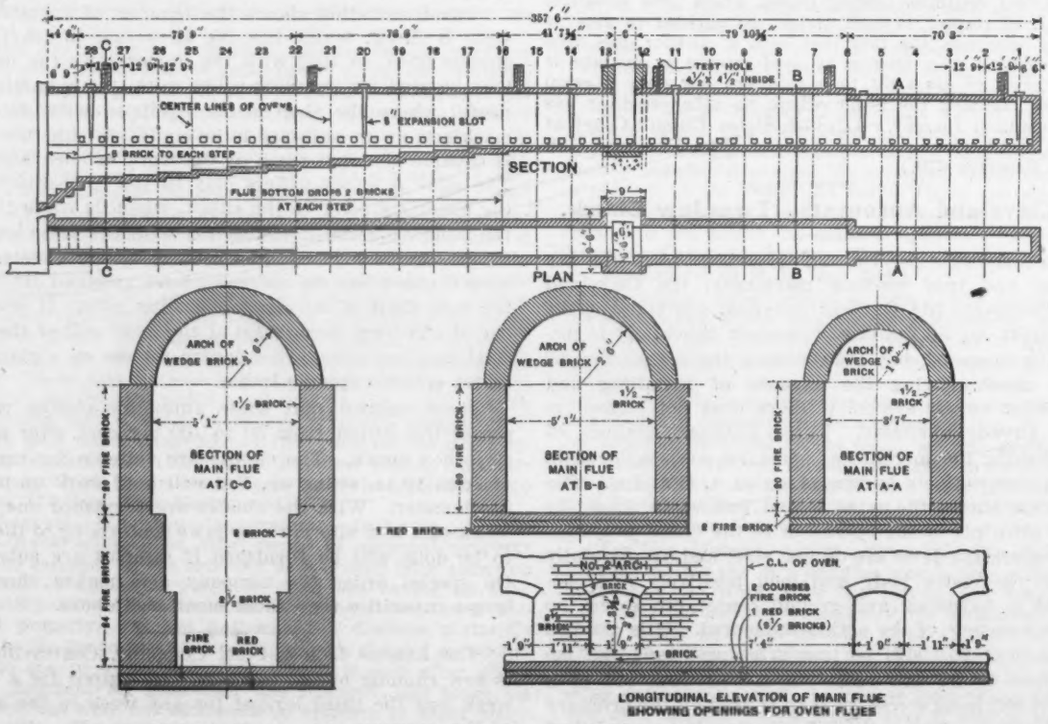
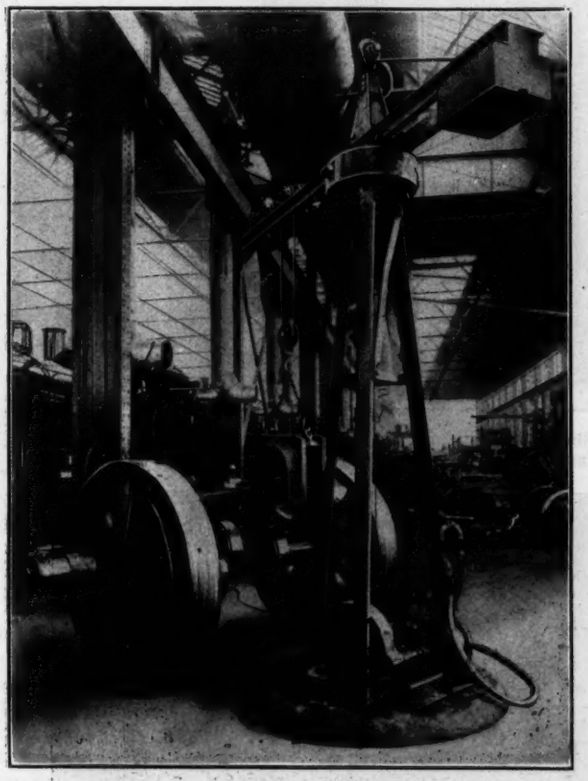


Fig. 2.—Elevation, Plan and Sections of Main Flue for Block of 56 Ovens.

A Whiting Portable Jib Crane.

The portable jib crane illustrated was designed by a master mechanic of one of the large railroads and has been some years in service in that road's erecting shop. Now the type has been made one of the standard lines of the Whiting Foundry Equipment Company, Harvey, Ill. The crane may be moved from part to part of the shop by an overhead traveling crane and will handle its loads without any further assistance from the traveling crane, leaving the latter free to be devoted to other and heavier work. The portable crane also makes the labor of the men engaged on a given job more efficient.

As an auxiliary service crane in railroad shops it may be employed to remove driving boxes, eccentric straps and eccentrics from driving axles, and after repairs have been made to refit these parts to the axles. One of these cranes will serve a shop handling 60 engines a month for average repairs, and from actual experience it is declared to save the labor of one mechanic and two helpers, amounting to about $200 per month. Besides this economy, one-third of the time of the traveling crane is available for other operations which could not be performed by one auxiliary crane, thus greatly increasing the commercial efficiency of the more expensive machine. This portable crane can also be used advantageously in locomotive boiler shops for handling pneumatic gap riveters or stay bolt breakers, in machine shops for assembling tools and for handling heavy vise work, &c.



A Portable Jib Crane Built by the Whiting Foundry Equipment Company, Harvey, Ill.

The crane consists of a heavy base plate supporting a structural pillar having a swivel plate on top on which the rotating jib is pivoted. A movable trolley is provided, which supports a block and hook. A weight attached to the opposite end of the jib balances the trolley and part of the load. The jib is stayed by tension rods, and a strut for the jib contains eyebolts for a clevis loop by which the crane is lifted and transported by an overhead traveling crane. The hoisting gearing is attached to the base plate or the structural pillar and is operated by an air engine, an electric motor or by hand power. The swinging and trolley travel is operated by hand power. These portable cranes are built in capacities ranging from 1000 lb. to 2 tons, with an effective radius of about 10 ft.

The Pullet Belt Shifter.

The illustration shows a countershaft equipped with the Pullet belt shifter, manufactured by the L. & D. Company, 88 Broad street, Boston, Mass. The oscillating lever, to which the pull cord is attached, is mounted on the sliding shifter bar, and its movement at the instance of the pull cord is constantly opposed by a compression spring, which also serves to lock the bar at the end of each stroke, by urging it upward so that one of the two notches in the upper face of the shifter bar will engage one of the bar guides. The pivoted spring support tends to keep in line with the direction of the push of the spring, and does so except at the extremes of movement.

The Pullet Belt Shifter Made by the L. & D. Company, Boston, Mass.

When the cord is pulled one wing of the oscillating lever engages a pin fixed in the stationary base plate, which acts as a fulcrum to move the bar to the right or left, shifting the belt from the tight to the loose pulley, or vice versa. The initial pull draws down the shifter bar, disengaging the notch previously caught on one of the guides on the base plate, leaving the bar free to move. At the end of the stroke the other notch is engaged. The center of rotation is now on the opposite side of the vertical center line and the compression spring in position to throw the oscillating lever to the reverse position, so that the next pull of the cord will shift the bar in the other direction.

The shifter is made in three sizes, each adjustable for two lengths of throw. It will be noticed that the handle can be located directly over the work. By clamping the base plate upside down and running the cord over pulleys the machine can be stopped and started from any desired point. The three sizes take belts respectively 1½ or 2 in., 2½ or 3 in., and 3½ or 4 in. wide.

The Treadwell Construction Company.

The Treadwell Construction Company has been incorporated under the laws of the State of Pennsylvania, with a capital stock of $100,000. This company has been formed by the same interests which are represented by the M. H. Treadwell companies of New York, Chicago and Lebanon, Pa. It has acquired the plant formerly occupied by the Rust Boiler Company at Midland, Beaver County, Pa., which consists of 27 acres of ground fronting on the Ohio River and crossed by the Cleveland & Pittsburgh Division of the Pennsylvania Railroad.

The buildings consist of a modern structural steel shop 100 x 416 ft., equipped with a 75-ft. span 20-ton electric overhead traveling crane, separate power plant with Rust boilers, engine and direct connected dynamo, hydraulic pump, compressor and accumulator, separate storage warehouse and separate office building. The tools formerly installed in the shop have all been removed, and the building is being completely re-equipped with the latest pattern of modern tools of large and heavy type for the manufacture of a general line of plate and structural work. The company is prepared to undertake the construction of blast furnaces, tanks, bins, water towers, standpipes, stacks, boilers and in particular the crooked and difficult kinds of steel construction. Paul W. Webster is vice-president and general manager of the company, and the main office is located at Midland, Pa.

H-S-G Steel Boiler Settings.

While it does not claim to be the originator of steel casing boiler settings, the Houston, Stanwood & Gamble Company, Cincinnati, Ohio, is probably the first to introduce them generally for stationary work. For many years boilers on the Ohio and Mississippi river steamboats and in coal elevators, pump boats, &c., along the rivers, have used some form or other of steel casing boiler setting, doing away with the principal part of the brick work in the ordinary stationary boiler setting. However, these settings were generally contrived for each individual case whereas this company has standardized them and is selling them as a regular line for general service.

Fig 1 shows two boilers set together with a single furnace of the ordinary type. The reason for combining furnaces in this particular instance was that a moist fuel is to be used which will burn better with a large fire. For coal burning, separate furnaces are supplied; each boiler has an independent casing and there is an air space separating them and columns between. An outfit of the latter type, comprising two 150-hp. boilers has been installed at the new plant of the Pfau Mfg. Company, Cincinnati, Ohio. It is adapted to use as fuel sugar cane bagasse, moist sawdust, &c.

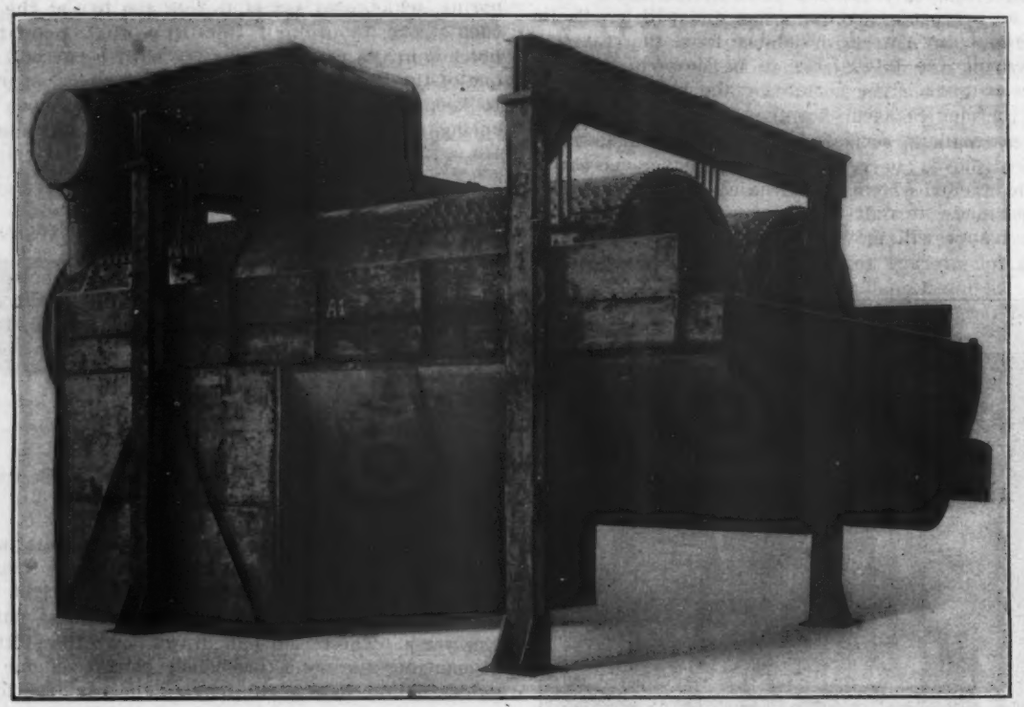


Fig. 1.—A Steel Casing Boiler Setting for Two Boilers with a Single Furnace, Built by the Houston, Stanwood & Gamble Company, Cincinnati, Ohio.

Fig. 2.—A Battery of Four Boilers with Separate Dutch Oven Type Furnaces.

Fig. 2 shows a battery consisting of four boilers, where each boiler has a separate furnace of the Dutch oven type for burning wet sawdust, bagasse or similar fuel. This furnace is also adapted to burning lignite.

Fig. 3 shows a setting to be used in west Texas. The

single large fire opening with double doors will be noticed as a peculiarity of the fire front. The large opening is to allow the spreading of the fuel over the very large grate surface as this setting is for a boiler fired with lignite.

The advantages of the steel casing in the various outfits referred to are the elimination of practically all the common brick, only the fire brick lining being retained; a very considerable reduction in space in the case of batteries of boilers for which the ordinary setting involves thick brick walls; the absence of air leaks —no brick walls to crack; and the avoidance of the labor difficulty in the large force of brick masons required for setting a large installation of boilers in some isolated localities—a very important point. Some incidental advantages, which in some cases would be considered and in others would not be given any importance, are the neat appearance of the steel setting; the light weight which adapts it to pump boats, &c., or wherever weight is objectionable; the possibility of taking it down, removing it to another place and erecting it a second time without the loss or expense incidental to the removal of a brick setting; and the durability of the heavy frame work of such a setting, the possible repairs being on the sheet work only, making the setting as a whole almost everlasting. A very cheap grade of asbestos, either in the form of cement or board, is placed immediately inside the sheet iron work and the radiation is thus very low.

Fig. 3.—A Setting Peculiar for the Wide Fire Door to Allow Spreading the Lignite Fuel.

The maker of these settings considers the launching into this field as a step in the right direction as by their use everything of a fire tube equipment, with the exception of the fire brick lining, is made in the boiler shop, and most of the work of installation is done by the millwright and a few laborers. The erection is much more expeditious than in the case of the old brick setting.

Owing to the additional space required by the American Trust & Savings Bank, on account of its merger with the Continental National Bank, H. M. Byllesby & Co., Chicago, have vacated the fifth floor of the American Trust Building and have opened temporary offices at Dearborn and Monroe streets, in the rooms formerly occupied by the Commercial National Bank. On October 1 they will move to the quarters now occupied by the Continental National Bank, which they will occupy until June 1, 1910, when they will again return to the American Trust Building. These removals are brought about solely for the purpose of accommodating the merged banks.

The foundry managers in Germany have formed an association under the name of Verein Deutscher Geissereifachleute, with headquarters at Sybelstrasse 60, Charlottenburg, Berlin. It is a technical society.

Electric Pig Iron Experiments in Sweden.

The London *Iron and Coal Trades Review* prints the following statement by Director Yngstrom on experiments at the Domnarfvet Works, Sweden, with the production of pig iron by means of electricity:

For some considerable time experiments have been made at the Domnarfvet Iron Works with the object of producing pig iron directly from iron ore in electric furnaces. These experiments have not yet been concluded, for which reason it has not been considered advisable to give a detailed report at the present moment. However, as the results, no doubt, would be of great importance to ironmasters and others, the author has obtained the permission of his co-partners to give a short report of the results arrived at.

In 1906 the A.-B. Electrometal and the Grängesberg and the Bergslaget Iron Mines entered into an agreement for the purpose of making experiments in producing iron by means of an electric furnace invented and constructed by three engineers, Messrs. Gronwall, Lindblad and Staalhane. This furnace was originally built according to the induction principle, but has been modified from time to time. It is sufficient to add that the hearth of the furnace is cylindrical—*i. e.*, the lower part of it, which is covered by an arch. The electric current, three-phase alternating, is conducted to the furnace through electrodes of carbon, passing to the cylinder shaped part of the furnace through the aforesaid arch, which is cooled by means of water. The pressure during the experiments has been about 40 volts, with about 8000 to 9500 amperes, and the load 480 to 500 kw. In order to protect the arch of the furnace against the high temperatures, furnace gas, which is obtained from the upper part of the furnace, is brought down under the arch through three openings by which a cooling effect is obtained. This arrangement has proved to be of great service and practical advantage.

The furnace is started and worked in the same way as an ordinary blast furnace. The charge used at present is of a weight of about 2 cwt. of ore from the Grängesberg Iron Mines (containing about 60 per cent. of iron), 7 lb. of slaked lime and 40 lb. of coke. According to an estimate made, this is equal to a consumption of 5 cwts. 3 qrs. of coke per ton of pig iron. The coke which was utilized contains 81 per cent. of carbon, 7 per cent. of water and 11 per cent. of ash. In a previous case an experiment was made with a charge containing 2 cwt. of ore, 39 lb. of coke and 4 lb. of lime, which is equal to about 5 cwt. 2 qr. of coke per ton of pig iron.

With regard to the products obtained in the furnace, the content of carbon has in certain cases been reduced to a figure as low as that of steel. As a rule, however, pig iron only has been produced. Time and experience will prove which of these products may be of the greatest advantage.

In the experiments which are now going on the content of carbon has generally averaged about 1.80 per cent., while it has previously been about 3.20 per cent. The content of silicon has been varying, as a rule, from 0.2 to 0.07 per cent., but it has also been higher, and in one particular case it was even as high as 4.40 per cent. The content of sulphur in gray pig iron has been reduced to 0.005 per cent., and even below this figure, while the content of sulphur in the coke utilized was about 0.5 per cent.

The supply of electric power is, however, of the greatest importance in the production of pig iron directly from ore by means of electricity. As regards such power in its relation to the industry and its capacity in the manufacture, no definite result has been arrived at; the average in the most favorable cases has been something above 2 tons per electric horsepower year. But there is every indication in favor of the supposition that, provided the supply of power to the furnace were to be increased, its thermal effect would also improve to such an extent that 3 tons per electric horsepower year ought to be obtained. According to a theoretical estimate made, the production should exceed even this figure, which is not at all improbable in view of the fact that 3 tons per electric horsepower year have been obtained by experiments made elsewhere.

The Metal Schedule in Its Final Shape.

The Complete Text of Schedule C of the New Tariff Bill, Showing the Form in Which It Was Reported by the Co ference Committee, July 30, and Passed by the House of Representatives, July 31.

The full text of schedule C, "Metals and Manufactures of," of the new tariff bill, in its latest revised state, is given below. It is not likely to undergo any further revision, as it has been passed by the House of Representatives in the exact form in which it was reported by the Conference Committee. Those who desire to compare the text here given with that of the bill in its prior stages are referred to *The Iron Age* of July 8, pages 106 to 111.

SCHEDULE C.

Metals and Manufactures Of.

117. Iron ore, including manganiferous iron ore, and the dross or residuum from burnt pyrites, fifteen cents per ton; Provided, That in levying and collecting the duty on iron ore, no deduction shall be made from the weight of the ore on account of moisture which may be chemically or physically combined therewith.

118. Iron in pigs, iron kentledge, spiegeleisen, and ferromanganese, two dollars and fifty cents per ton; wrought and cast scrap iron, and scrap steel, one dollar per ton, but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured by melting, and excluding pig iron in all forms.

119. Bar iron, muck bars, square iron, rolled or hammered, comprising flats not less than one inch wide nor less than three-eighths of one inch thick, round iron not less than seven-sixteenths of one inch in diameter, three-tenths of one cent per pound.

120. Round iron, in coils or rods, less than seven-sixteenths of one inch in diameter, and bars or shapes of rolled or hammered iron, not specially provided for in this section, six-tenths of one cent per pound: Provided, That all iron in slabs, blooms, loops or other forms less finished than iron in bars, and more advanced than pig iron, except castings, shall be subject to duty of four-tenths of one cent per pound: Provided further, That all iron bars, blooms, billets, slabs or loops, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of eight dollars per ton.

121. Beams, girders, joists, angles, channels, car truck channels, TT, columns and posts or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes of iron or steel, not assembled, or manufactured, or advanced beyond hammering, rolling, or casting, valued at nine-tenths of one cent per pound or less, three-tenths of one cent per pound; valued above nine-tenths of one cent per pound, four-tenths of one cent per pound.

122. Boiler or other plate iron or steel, except crucible plate steel and saw plates hereinafter provided for in this section, not thinner than number ten wire gauge, cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at eight-tenths of one cent per pound or less, three-tenths of one cent per pound; valued above eight-tenths of one cent and not above one cent per pound, four-tenths of one cent per pound; valued above one cent and not above two cents per pound, five-tenths of one cent per pound; valued above two cents and not above three cents per pound, six-tenths of one cent per pound; valued at over three cents per pound, twenty per centum ad valorem: Provided, That all sheets or plates of iron or steel thinner than number ten wire gauge shall pay duty as iron or steel sheets.

123. Iron or steel anchors or parts thereof, one cent per pound; forgings of iron or steel, or of combined iron and steel, but not machined, tooled, or otherwise advanced in condition by any process or operation subsequent to the forging process, not specially provided for in this section, thirty per centum ad valorem; anti-friction balls, ball bearings, and roller bearings, of iron or steel or other metal, finished or unfinished, forty-five per centum ad valorem.

124. Hoop, band, or scroll iron or steel, not otherwise provided for in this section, valued at three cents per pound or less, eight inches or less in width, and less than three-eighths of one inch thick and not thinner than number ten wire gauge, three-tenths of one cent per pound; thinner than number ten wire gauge and not thinner than number twenty wire gauge, four-tenths of one cent per pound; thinner than number twenty wire gauge, six-tenths of one cent per pound: Provided, That barrel hoops of iron or steel, and hoop or band iron or hoop or band steel flared, splayed or punched, with or without buckles or fastenings, shall pay one-tenth of one cent per pound more duty than that imposed on the hoop or band iron or steel from which they are made; bands and strips of steel exceeding twelve feet in length, not specially provided for in this section, thirty-five per centum ad valorem.

125. Hoop or band iron, or hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for baling cotton or any other commodity, three-tenths of one cent per pound.

126. Railway bars, made of iron or steel, and railway bars made in part of steel, T rails and punched iron or steel flat rails, seven-fortieths of one cent per pound; railway fish plates or splice bars, made of iron or steel, three-tenths of one cent per pound.

127. Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel, valued at three cents per pound or less, thinner than number ten and not thinner than number twenty wire gauge, five-tenths of one cent per pound; thinner than number twenty wire gauge and not thinner than number twenty-five wire gauge, six-tenths of one cent per pound; thinner than number twenty-five wire gauge and not thinner than number thirty-two wire gauge, eight-tenths of one cent per pound; thinner than number thirty-two wire gauge, nine-tenths of one cent per pound; corrugated or crimped, eight-tenths of one cent per pound; all the foregoing valued at more than three cents per pound, thirty per centum ad valorem: Provided, That all sheets or parts of common or black iron or steel not thinner than number ten wire gauge shall pay duty as plate iron or plate steel.

128. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates, and taggers tin, and hereinafter provided for, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall pay two-tenths of one cent per pound more duty than if the same was not so galvanized or coated; sheets or plates composed of iron, steel, copper, nickel, or other metal, with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, forty per centum ad valorem.

129. Sheets of iron or steel, polished, planished, or glanced, by whatever name designated, one and one-half cents per pound: Provided, That plates or sheets of iron or steel, by whatever name designated, other than the polished, planished, or glanced herein provided for, which have been pickled or cleaned by acid, or by any other material or process, or which are cold rolled, smoothed only, not polished, shall pay two-tenths of one cent per pound more duty than the corresponding gauges of common or black sheet iron or steel.

130. Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates, and taggers tin, one and two-tenths cents per pound.

131. Steel ingots, cogged ingots, blooms, and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; mill shafting; pressed, sheared, or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun barrel molds not in bars; alloys used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates and steel not specially provided for in this section, all of the above valued at three-fourths of one cent per pound or less, seven-fortieths of one cent per pound; valued above three-fourths of one cent and not above one and three-tenths cents per pound, three-tenths of one cent per pound; valued above one and eight-tenths cents per pound, five-tenths of one cent per pound; valued above one and eight-tenths cents and not above two and two-tenths cents per pound, six-tenths of one cent per pound; valued above two and two-tenths cents and not above three cents per pound, eight-tenths of one cent per pound; valued above three cents per pound and not above four cents per pound, one and one-tenth cents per pound; valued above four cents and not above seven cents per pound, one and two-tenths cents per pound; valued above seven cents and not above ten cents per pound, one and nine-tenths cents per pound; valued above ten cents and not above thirteen cents per pound, two and three-tenths cents per pound; valued above thirteen cents and not above sixteen cents per pound, two and seven-tenths cents per pound; valued above sixteen cents and not above twenty-four cents per pound, four and six-tenths cents per pound; valued above twenty-four cents and not above thirty-two cents per pound, six cents per pound; valued above thirty-two cents and not above forty cents per pound, seven cents per pound; valued above forty cents per pound, twenty per centum ad valorem.

132. Steel wool or steel shavings, forty per centum ad valorem.

133. Grit, shot and sand made from iron or steel that can be used only as abrasives, one cent per pound.

134. Wire rods: Rivet, screw, fence, and other iron or steel

wire rods, whether round, oval, flat or square, or in any other shape, and nail rods, all the foregoing in coils or otherwise, valued at four cents or less per pound, three-tenths of one cent per pound; valued over four cents per pound, six-tenths of one cent per pound: Provided, That all round iron or steel rods smaller than number six wire gauge shall be classed and dutiable as wire: Provided further, That all iron or steel wire rods which have been tempered or treated in any manner or partly manufactured shall pay an additional duty of one-half of one cent per pound.

135. Round iron or steel wire, not smaller than number thirteen wire gauge, one cent per pound; smaller than number thirteen and not smaller than number sixteen wire gauge, one and one-fourth cents per pound; smaller than number sixteen wire gauge, one and three-fourths cents per pound: Provided, That all the foregoing shall pay duty at not less than thirty-five per centum ad valorem; all wire composed of iron, steel, or other metal except gold or silver, covered with cotton, silk, or other material, corset clasps, corset steels, dress steels, and all flat wires, and steel in strips, not thicker than number fifteen wire gauge and not exceeding five inches in width, whether in long or short lengths, in coils or otherwise, and whether rolled or drawn through dies or rolls, or otherwise produced, and all other wire not specially provided for in this section, shall pay a duty of not less than thirty-five per centum ad valorem; on iron or steel wire coated by dipping, galvanizing or similar process with zinc, tin, or other metal, there shall be paid two-tenths of one cent per pound in addition to the rate imposed on the wire of which it is made: Provided further, That articles manufactured wholly or in chief value of any wire or wires provided for in this paragraph shall pay the maximum rate of duty imposed in this section upon any wire used in the manufacture of such articles, and in addition thereto one cent per pound. And provided further, That no article made from or composed of wire shall pay a less rate of duty than forty per centum ad valorem; telegraph, telephone, and other wires and cables composed of metals and rubber, or of metal, rubber, and other materials, forty per centum ad valorem; barbed fence wire, three-quarters of one cent per pound, but the same shall not be subject to any additional or other rate of duty hereinbefore provided; wire heddles or healds, twenty-five cents per thousand and in addition thereto forty per centum ad valorem.

136. No article not specially provided for in this section, which is wholly or partly manufactured from tin plate, terne plate, or the sheet, plate, hoop, band or scroll iron or steel herein provided for, or of which such tin plate, terne plate, sheet, plate, hoop, band or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terne plate, or sheet, plate, hoop, band or scroll iron or steel from which it is made, or of which it shall be the component thereof of chief value.

137. On all iron or steel bars or rods of whatever shape or section which are cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-eighth of one cent per pound in addition to the rates provided in this section on bars or rods of whatever section or shape which are hot rolled; and on all strips, plates or sheets of iron or steel of whatever shape, other than the polished, planished, or glanced sheet iron or sheet steel hereinbefore provided for, which are cold hammered, blued, brightened, tempered or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only, hereinbefore provided for, there shall be paid four-tenths of one cent per pound in addition to the rates provided in this section upon plates, strips or sheets or iron or steel of common or black finish of corresponding gauge or value; and on steel circular saw plates there shall be paid one-fourth of one cent per pound in addition to the rates provided in this section for steel plates.

138. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron or steel.

139. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast or made from iron or its ores, by the crucible, Bessemer, Clapp-Griffith, pneumatic, Thomas-Gilchrist, basic, Siemens-Martin, or open-hearth process, or by the equivalent of either, or by a combination of two or more of the processes, or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable-iron castings, shall be classed and denominated as steel.

140. Anvils of iron or steel, of iron and steel combined, by whatever process made, or in whatever stage of manufacture, one and five-eighths cents per pound.

141. Automobiles, bicycles and motorcycles, and finished parts of any of the foregoing, not including tires, forty-five per centum ad valorem.

142. Axles, or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, not otherwise provided for in this section, valued at not more than six cents per pound, three-fourths of one cent per pound: Provided, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted.

143. Blacksmith's hammers and sledges, track tools, wedges and crowbars, whether of iron or steel, one and three-eighths cents per pound.

144. Bolts, with or without threads or nuts, or bolt blanks and finished hinges or hinge blanks, whether of iron or steel, one and one-eighth cents per pound.

145. Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or untempered round steel wire, twenty cents per square foot; when manufactured with tempered round steel wire, forty-five cents per square foot; when manufactured with plated wire or other than round iron or steel wire, or with felt face, wool face, or rubber face cloth containing wool, fifty-five cents per square foot.

146. Cast-iron pipe of every description, one-fourth of one cent per pound.

147. Cast iron andirons, plates, stove plates, sadirons, tailor's irons, hatter's irons and castings and vessels wholly of cast iron, eight-tenths of one cent per pound. All castings of iron or cast-iron plates which have been chiseled, drilled, machined or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles, shall pay two-tenths of one cent per pound more than the rate imposed upon the castings of iron and cast-iron plates hereinbefore provided for.

148. Castings of malleable iron not specially provided for in this section, seven-tenths of one cent per pound.

149. Cast hollow ware, coated, glazed, or tinned, one and one-half cents per pound.

150. Chain or chains of all kinds, made of iron or steel, not less than three-fourths of one inch in diameter, seven-eighths of one cent per pound; less than three-fourths of one inch and not less than three-eighths of one inch in diameter, one and one-eighth cents per pound; less than three-eighths of one inch in diameter and not less than five-sixteenths of one inch in diameter, one and six-eighths cents per pound; less than five-sixteenths of one inch in diameter, three cents per pound; but no chain or chains of any description shall pay a lower rate of duty than forty-five per centum ad valorem.

151. Lap welded, butt welded, seamed, or jointed iron or steel tubes, pipes, flues, or stays, not thinner than number sixteen wire gauge, if not less than three-eighths of an inch in diameter, one cent per pound; if less than three-eighths of an inch and not less than one-fourth of an inch in diameter, one and one-half cents per pound; if less than one-fourth of an inch in diameter, two cents per pound: Provided, That no tubes, pipes, flues or stays made of charcoal iron shall pay a less rate of duty than one and one-half cents per pound; cylindrical or tubular tanks or vessels, for holding gas, liquids or other material, whether full or empty, thirty per centum ad valorem; flexible metal tubing or hose, not specially provided for in this section, whether covered with wire or other material, or otherwise, including any appliances or attachments affixed thereto, thirty per centum ad valorem; welded cylindrical furnaces, tubes or flues made from plate metal and corrugated, ribbed or otherwise reinforced against collapsing pressure, two cents per pound; all other iron or steel tubes, finished, not specially provided for in this section, thirty per centum ad valorem.

152. Pen knives, pocket knives, clasp knives, pruning knives, budding knives, erasers, manicure knives, and all knives by whatever name known, including such as are denominatively mentioned in this section which have folding or other than fixed blades or attachments, valued at not more than forty cents per dozen, forty per centum ad valorem; valued at more than forty cents per dozen and not exceeding fifty cents per dozen, one cent per piece and forty per centum ad valorem; valued at more than fifty cents per dozen and not exceeding one dollar and twenty-five cents per dozen, five cents per piece and forty per centum ad valorem; valued at more than one dollar and twenty-five cents per dozen and not exceeding three dollars per dozen, ten cents per piece and forty per centum ad valorem; valued at more than three dollars per dozen, twenty cents per piece and forty per centum ad valorem: Provided, That any of the foregoing knives or erasers, if imported in the condition of assembled, but not fully finished, shall be dutiable at not less than the rate of duty herein imposed upon fully finished knives and erasers of the same material and quality, but not less in any case than ten cents each and forty per centum ad valorem: Provided further, That blades, handles, or other parts of any of the foregoing knives or erasers shall be dutiable at not less than the rate herein imposed upon knives and erasers valued at more than fifty cents per dozen and not exceeding one dollar and twenty-five cents per dozen; razors, finished, valued at less than one dollar per dozen, thirty-five per centum ad valorem; valued at one dollar and less than one dollar and fifty cents per dozen, six cents each and thirty-five per centum ad valorem; valued at one dollar and fifty cents and less than two dollars per dozen, ten cents each and thirty-five per centum ad valorem; valued at two dollars and less than three dollars per dozen, twelve cents each and thirty-five per centum ad valorem; valued at three dollars or more per dozen, fifteen cents each and thirty-five per centum ad valorem: Provided, That blades (except safety razors), handles, and unfinished razors shall pay no less duty than that imposed on finished razors valued at two dollars per dozen: Provided further, That on and after October 1, 1909, all the articles specified in this paragraph shall when imported have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the shank or tang of at least one, or if practicable, each and every blade thereof. Scissors and shears, and blades for the same, finished or un-

finished, valued at not more than fifty cents per dozen, fifteen per centum ad valorem; valued at more than fifty cents and not more than one dollar and seventy-five cents per dozen, fifty cents per dozen and fifteen per centum ad valorem; valued at more than one dollar and seventy-five cents per dozen, seventy-five cents per dozen and twenty-five per centum ad valorem.

153. Sword blades and swords and side arms irrespective of quality or use, in part of metal, fifty per centum ad valorem.

154. Table, butchers', carving, cooks', hunting, kitchen, bread, butter, vegetable, fruit, cheese, carpenters' bench, curriers', drawing, farriers', fleshing, hay, tanners', plumbers', painters', pallette, artists', and shoe knives, forks and steels, finished or unfinished; if imported with handles of mother-of-pearl, shell, ivory, silver, nickeled silver, or other metal than iron or steel, fourteen cents each; with handles of deerhorn, ten cents each; with handles of hard rubber, solid bone, celluloid, or any pyroxyline material, four cents each; with handles of any other material than those above mentioned, one cent each, and in addition, on all of the above articles, fifteen per centum ad valorem; any of the knives, forks or steels, enumerated in this paragraph, if imported without handles, forty per centum ad valorem: Provided, That none of the above-named articles shall pay a less rate of duty than forty per centum ad valorem: Provided, That all the articles specified in this paragraph when imported on and after October 1, 1909, shall have the name of the maker or purchaser and beneath the same the name of the country of origin indelibly stamped or branded thereon in a place that shall not be covered thereafter.

155. Files, file blanks, rasps, and floats of all cuts and kinds, two and one-half inches in length and under, twenty-five cents per dozen; over two and one-half inches in length and not over four and one-half inches, forty-seven and one-half cents per dozen; over four and one-half inches in length and under seven inches, sixty-two and one-half cents per dozen; seven inches in length and over, seventy-seven and one-half cents per dozen.

156. Muskets, muzzle-loading shotguns, rifles, and parts thereof, twenty-five per centum ad valorem.

157. Double-barreled, sporting, breechloading shotguns, combination shotguns and rifles, valued at not more than five dollars, one dollar and fifty cents each and in addition thereto fifteen per centum ad valorem; valued at more than five dollars and not more than ten dollars, four dollars each and in addition thereto fifteen per centum ad valorem each; valued at more than ten dollars, six dollars each; double barrels for sporting breech-loading shotguns and rifles, further advanced in manufacture than rough-bored only, three dollars each; stocks for double-barreled sporting breech-loading shotguns and rifles wholly or partially manufactured, three dollars each; and in addition thereto on all such guns and rifles, valued at more than ten dollars each, and on such stocks and barrels, thirty-five per centum ad valorem; on all other parts of such guns or rifles, and fittings for such stocks or barrels, finished or unfinished, fifty per centum ad valorem: Provided, That all double-barreled sporting breech-loading shotguns and rifles imported without a lock or locks or other fittings shall be subject to a duty of six dollars each and thirty-five per centum ad valorem; single-barreled breech-loading shotguns, or parts thereof, except as otherwise specially provided for in this section, one dollar each and thirty-five per centum ad valorem; pistols, automatic, magazine, or revolving, or parts thereof, seventy-five cents each and twenty-five per centum ad valorem.

158. Table, kitchen and hospital utensils or other similar hollowware, of iron or steel, enameled or glazed with vitreous glasses, but not ornamented or decorated with lithographic or other printing, forty per centum ad valorem.

159. Cut nails and cut spikes of iron or steel, four-tenths of one cent per pound.

160. Horseshoe nails, hob nails, and all other wrought iron or steel nails not specially provided for in this section, one and one-half cents per pound.

161. Wire nails made of wrought iron or steel, not less than one inch in length and not lighter than number sixteen wire gauge, four-tenths of one cent per pound; less than one inch in length and lighter than number sixteen wire gauge, three-fourths of one cent per pound.

162. Spikes, nuts and washers, and horse, mule, or ox shoes, of wrought iron or steel, three-fourths of one cent per pound.

163. Cut tacks, brads, or sprigs, not exceeding sixteen ounces to the thousand, five-eighths of one cent per thousand; exceeding sixteen ounces to the thousand, three-fourths of one cent per pound.

164. Needles for knitting or sewing machines, one dollar per thousand and twenty-five per centum ad valorem; latch needles, one dollar and fifteen cents per thousand and thirty-five per centum ad valorem; crochet needles and tape needles, knitting and all other needles, not specially provided for in this section, and bodkins of metal, twenty-five per centum ad valorem; but no articles other than the needles which are specifically named in this section shall be dutiable as needles unless having an eye, and fitted or used for carrying a thread. Needle cases or needle books furnished with assortments of needles or combinations of needles and other articles, shall pay duty as entireties according to the component material of chief value therein.

165. Fish hooks, fishing rods and reels, artificial flies, artificial bait, snelled hooks and all other fishing tackle or parts thereof, not specially provided for in this section, except fishing lines, fishing nets and seines, forty-five per centum ad valorem.

166. Steel plates engraved, stereotype plates, electrotype plates, and plates of other materials, engraved for printing, twenty per centum ad valorem; plates of iron or steel engraved or fashioned for use in the production of designs, patterns or impressions on glass in the process of manufacturing plate or other glass, twenty-five per centum ad valorem; lithographic plates of stone or other material, engraved, drawn, or prepared, and wet transfer paper or paper prepared wholly with glycerin, or glycerin combined with other materials, containing the imprints taken from lithographic plates, fifty per centum ad valorem.

167. Rivets, studs, and steel points, lathed, machined, or brightened, and rivets or studs for nonskidding automobile tires, forty-five per centum ad valorem; rivets of iron or steel, not specially provided for in this section, one and one-fourth cents per pound.

168. Crosscut saws, five cents per linear foot; mill saws, eight cents per linear foot; pit and drag saws, six cents per linear foot; circular saws, twenty per centum ad valorem; steel band saws, finished or further advanced than tempered and polished, five cents per pound and twenty per centum ad valorem; hand, back, and all other saws, not specially provided for in this section, twenty-five per centum ad valorem.

169. Screws, commonly called wood screws, made of iron or steel, more than two inches in length, three and one-half cents per pound; over one inch and not more than two inches in length, five cents per pound; over one-half inch and not more than one inch in length, eight cents per pound; one-half inch and less in length, ten cents per pound.

170. Umbrella and parasol ribs and stretchers, composed in chief value of iron, steel, or other metal, in frames or otherwise, and tubes for umbrellas wholly or partially finished, fifty per centum ad valorem.

171. Wheels for railway purposes, or parts thereof, made of iron or steel, and steel tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires or parts thereof, wholly or partly manufactured, one and one-fourth cents per pound; ingots, cogged ingots, blooms, or blanks for the same, without regard to the degree of manufacture, one cent per pound: Provided, That when wheels for railway purposes, or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together shall be dutiable at the same rate as is provided for the wheels when imported separately.

172. Aluminum, aluminum scrap, and alloys of any kind in which aluminum is the component material of chief value, in crude form, seven cents per pound; in plates, sheets, bars, and rods, eleven cents per pound; barium, calcium, magnesium, sodium, and potassium, and alloys of which said metals are the component material of chief value, three cents per pound and twenty-five per centum ad valorem.

173. Antimony, as regulus or metal, one and one-half cents per pound; antimony ore, stibnite and matte containing antimony, but not containing more than ten per centum of lead, one cent per pound on the antimony contents therein contained: Provided, That on all importations of antimony bearing ores and matte containing antimony the duties shall be estimated at the port of entry and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise. On the arrival of the ores at such establishment they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishment and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper customs officers, and the import entry shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law, and the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph; antimony, oxide of, one and one-half cents per pound and twenty-five per centum ad valorem.

174. Argentine, albata, or German silver, unmanufactured, twenty-five per centum ad valorem.

175. Bronze powder, brocades, flitters and metallics, twelve cents per pound; bronze, or Dutch metal or aluminum, in leaf, six cents per one hundred leaves.

176. Copper, in rolled plates, called braziers' copper, sheets, rods, pipes and copper bottoms, two and one-half cents per pound; sheathing or yellow metal, of which copper is the component material of chief value, and not composed wholly or in part of iron ungalvanized, two cents per pound.

177. Gold leaf, thirty-five cents per one hundred leaves. The foregoing rate applies to leaf not exceeding in size the equivalent of three and three-eighths by three and three-eighths inches; additional duties in the same proportion shall be assessed on leaf exceeding in size said equivalent.

178. Silver leaf, ten cents per one hundred leaves.

179. Tinsel wire, lame or lahn, made wholly or in chief value of gold, silver, or other metal, five cents per pound; bullions and metal threads, made wholly or in chief value of tinsel wire, lame or lahn, five cents per pound and thirty per centum ad valorem; fabrics, laces, embroideries, braids, galloons, trimmings, ribbons, beltings, ornaments, toys, or other articles, made wholly or in chief value of tinsel wire, lame or lahn, bullions or metal threads, fifteen cents per pound and sixty per centum ad valorem.

180. Hooks and eyes, metallic, whether loose, carded, or

otherwise, including weight of cards, cartons, and immediate wrappings and labels, four and one-half cents per pound and fifteen per centum ad valorem.

181. Lead bearing ore of all kinds, one and one-half cents per pound on the lead contained therein: Provided, That on all importations of lead bearing ores the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise. On the arrival of the ores at such establishments they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper customs officers, and the import entries shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law. And the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph.

182. Lead dross, lead bullion or base bullion, lead in pigs and bars, lead in any form not specially provided for in this section, old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured; all the foregoing, two and one-eighth cents per pound; lead in sheets, pipe, shot, glaziers' lead and lead wire, two and three-eighths cents per pound.

183. Metallic mineral substances in a crude state, and metals unwrought, whether capable of being wrought or not, not specially provided for in this section, twenty per centum ad valorem; monazite sand and thorite, four cents per pound; thorium, oxide of and salts of, gas mantles treated with chemicals or metallic oxides and gas mantle scrap, consisting in chief value of metallic oxides, forty per centum ad valorem.

184. Chrome or chromium metal, ferrochrome, or ferrochromium, ferromolybdenum, ferrophosphorus, ferrotitanium, ferrotungsten, ferrovanadium, molybdenum, titanium, tantalum, tungsten, or wolfram metal, valued at two hundred dollars per ton or less, twenty-five per centum ad valorem; ferrosilicon, containing not more than fifteen per centum of silicon, five dollars per ton; ferrosilicon containing more than fifteen per centum of silicon, twenty per centum ad valorem.

185. Nickel, nickel oxide, alloy of any kind in which nickel is a component material of chief value, in pigs, ingots, bars, rods, plates, but not rolled or drawn, six cents per pound; sheets, strips and wire, thirty-five per centum ad valorem.

186. Pens, metallic, except gold pens, twelve cents per gross; with nib and barrel in one piece, fifteen cents per gross.

187. Penholder tips, penholders and parts thereof, five cents per gross and twenty-five per centum ad valorem; gold pens, twenty-five per centum ad valorem; fountain pens, stylographic pens, thirty per centum ad valorem; combination penholders, comprising penholder, pencil, rubber eraser, automatic stamp, or other attachment, forty-five per centum ad valorem: Provided, That pens and penholders shall be assessed for duty separately.

188. Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet, and shawl pins; any of the foregoing composed wholly of brass, copper, iron, steel, or other base metal, not plated with gold or silver, and not commonly known as jewelry, thirty-five per centum ad valorem.

189. Quicksilver, seven cents per pound. The flasks, bottles, or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

190. Tungsten bearing ores of all kinds, ten per centum ad valorem.

191. Type metal, one and one-half cents per pound on the lead contained therein; new types, twenty-five per centum ad valorem.

192. Watch movements, including time detectors, whether imported in cases or not, if having not more than seven jewels, seventy-five cents each; if having more than seven jewels and not more than eleven jewels, one dollar and thirty-five cents each; if having more than eleven jewels and not more than fifteen jewels, one dollar and eighty-five cents each; if having more than fifteen and not more than seventeen jewels, one dollar and twenty-five cents each and twenty-five per centum ad valorem; if having more than seventeen jewels, three dollars each and twenty-five per centum ad valorem; watch cases and parts of watches, chronometers, box or ship, and parts thereof, forty per centum ad valorem; lever clock movements having jewels in the escapement, and clocks containing such movements, one dollar each and forty per centum ad valorem; all other clocks and parts thereof, not otherwise provided for in this section, whether separately packed or otherwise, not composed wholly or in chief value of china, porcelain, parian, bisque, or earthenware, forty per centum ad valorem; all jewels for use in the manufacture of watches or clocks, ten per centum ad valorem; enameled dials for watches or other instruments, three cents per dial and forty per centum ad valorem: Provided, That all watch and clock dials, whether attached to movements or not, shall have indelibly painted or printed thereon the country of origin and that all watch movements, lever clock movements with jewels in the escapement, and cases of foreign manufacture shall have the name of the manufacturer and country of manufacture cut, engraved, or die-sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and the movements shall also have marked thereon by one of the methods indicated the number of jewels and adjustments, said number to be expressed both in words and in Arabic numerals; and none of the aforesaid articles shall be delivered to the importer unless marked in exact conformity to this direction.

193. Zinc-bearing ore of all kinds, including calamine, containing less than 10 per centum of zinc, shall be admitted free of duty; containing 10 per centum or more of zinc and less than 20 per centum, one-quarter of one cent per pound on the zinc contained therein; containing 20 per centum or more of zinc and less than 25 per centum, one-half of one cent per pound on the zinc contained therein; containing 25 per centum of zinc, or more, one cent per pound on the zinc contained therein: Provided, That on all importations of zinc-bearing ores the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise. On the arrival of the ores at such establishments they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper customs officers, and the import entries shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law. And the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph.

194. Zinc in blocks or pigs and zinc dust, one and three-eighths cents per pound; in sheets, one and one-half cents per pound; in sheets coated or plated with nickel or other metal, or solutions, one and three-fourths cents per pound; old and worn-out, fit only to be remanufactured, one cent per pound.

195. Cans, boxes, packages, and other containers of all kinds (except such as are hermetically sealed by soldering or otherwise), composed wholly or in chief value of metal lacquered or printed by any process of lithography whatever, if filled or unfilled, and whether their contents be dutiable or free, four cents per pound and thirty-five per centum ad valorem: Provided, That none of the foregoing articles shall pay a less rate of duty than fifty-five per centum ad valorem; but no cans, boxes, packages, or containers of any kind, of the capacity of five pounds or under, subject to duty under this paragraph, shall pay less duty than if the same were imported empty; and the dutiable value of the same shall include all packing charges, cartons, wrappings, envelopes, and printed matter accompanying them when such cans, boxes, packages, or containers are imported wholly or partly filled with merchandise exempt from duty (except liquids and merchandise commercially known as drugs) and which is commonly dealt in at wholesale in the country of original exportation in bulk or in packages exceeding five pounds in capacity: Provided further, That paper, cardboard, or pasteboard, wrappings or containers that are made and used only for the purpose of holding or containing the article with which they are filled, and after such use are mere waste material, shall not be dutiable unless their contents are dutiable.

196. Bottle caps of metal, if not colored, waxed, lacquered, enameled, lithographed, or embossed in color, one-half of one cent per pound and forty-five per centum ad valorem; if colored, waxed, lacquered, enameled, lithographed, or embossed in color, fifty-five per centum ad valorem.

197. Cash registers, jute-manufacturing machinery, linotype and all type-setting machines, machine tools, printing presses, sewing machines, typewriters, and all steam engines, thirty per centum ad valorem; embroidery machines and lace-making machines, including machines for making lace curtains, nets, or nettings, forty-five per centum ad valorem: Provided, however, That all embroidery machines and Lever or Gothrough lace-making machines, and machines used only for the weaving of linen cloth from flax and flax fiber, and tar and oil spreading machines used in the construction and maintenance of roads and in improving them by the use of road preservatives, shall, if imported prior to January first, nineteen hundred and eleven, be admitted free of duty.

198. Nippers and pliers of all kinds, except blacksmith tongs, surgical and dental instruments or parts thereof, wholly or partly manufactured, eight cents per pound and forty per centum ad valorem.

199. Articles or wares not specially provided for in this section, composed wholly or in part of iron, steel, lead, copper, nickel, pewter, zinc, gold, silver, platinum, aluminum, or other metal, and whether partly or wholly manufactured, forty-five per centum ad valorem.

To meet the increasing demand for gasoline motor cars for railroad use, the McKeen Motor Car Company, Omaha, Neb., is seeking to provide additional shop facilities, doubling its present output capacity. The question of increasing the present works, which are somewhat cramped for space, or of seeking a new location, is up for consideration, but no definite decision has as yet been reached.

Trade Publications.

Coal Washing Machinery.—American Coal Washer Company, Alton, Ill. Bulletin No. 10, 7 x 10 in., 47 pages. Describes principally the coal washing plant of the Superior Coal Company of Gillespie, Ill., which is the largest fuel coal washery in America and has a capacity of 256 tons in 8 hr. Some interesting views of the washery are shown and the more important equipment is described with the aid of line drawings. The various departments in the washery are taken up and separately described. A section of the book is given over to views of other installations.

Petroleum Can Machinery.—Charles Leffler & Co., Brooklyn, N. Y. Catalogue, 6 x 8 in. This is an original catalogue in the form of a collection of blueprints showing a line of machinery for the manufacture of 5-gal. petroleum cans. About 25 machines are shown. The company also makes machinery for manufacturing steel drums and all kinds of steel cans, and the line includes power presses, combination dies, power angle bending machines, power squeezers for automatically centering cans and squeezing on ends, crimping machines, &c. A description of the Leffler double seamer was given in *The Iron Age* July 22, 1909.

Tachometers and Tachographs.—Schuchardt & Schutte, 90 West street, New York. Booklet. These instruments, which serve to indicate on a dial or to record on a chart the speed of engine and motor shafts, flywheel peripheries, the progressive speed of motor cars and other measurements of rotative and progressive speed, are shown in numerous types. Cut meters for recording the cutting speed of machine tools, belt speeds, &c., are also illustrated and a handy revolution counter is shown. The booklet is well arranged and the various instruments are thoroughly described.

Rail Testing Machines.—Pennsylvania Steel Company, Steelton, Pa. Folder. Describes a machine designed primarily to determine the relative durability of the different varieties of steel rails made by the Pennsylvania Steel Company, but it has been developed with a view to ascertaining facts not strictly relating to durability, such as the effects on rails of wheels, of brakes and of slipping driving wheels. With its aid the relative co-efficients of adhesion for different varieties of rail can be measured. The relative effectiveness of the various types of rail joints can be determined and the effect of flat-spotted car wheels on different varieties of rails can be observed. The machine is shown and its working parts are fully described.

Milling Attachments.—Porter-Cable Machine Company, Syracuse, N. Y. Folder. Describes a sensitive high speed universal milling attachment which is adaptable for use on any make or size of milling machine having an overhanging arm, and it will handle mills up to 1 in. in diameter. An adjustable clamp for attachment permits its use on any machine of the type mentioned. This clamp attaches to an overhanging arm and it is also supported on a horizontal shaft or arbor inserted in the main spindle of the machine.

Hydraulic Machinery.—William H. Wood, Media, Pa. Catalogue, 6½ x 11 in., 56 pages. A varied line of hydraulic machinery is shown and described here, including pressure pumps, hydraulic jib mast and overhead cranes, hydraulic pressure gauges, bending machines, upsetting and forming machines, forging machines in a number of types, punching and shearing machines, riveting machines and a 48-in. hydraulic shear. Some of the heavy equipment is described with the aid of line drawings and a list of users is given.

Transmission Chains.—Morse Chain Company, Ithaca, N. Y. Machine tool bulletin No. 8, 34 pages. Shows the adaptability of the Morse silent-running high-speed chains for use in machine tool drives. The chain is made in many different pitches and widths for drives ranging from 14 to 1000 hp., and transmissions are furnished to run from the slowest rotative speeds up to 3000 rev. per min. Illustrations are given showing the chain in use on shapers, gear cutters, boring mills, rack cutting machines, gear cutting machines, heavy bending rolls, &c.

Electrical Equipment.—Western Electric Company, New York. Three folders. One refers to motors, lamps and exhaust fans, with particular reference to their use in laundries. Another briefly describes Hawthorn magneto test sets, and the third deals with Hawthorn seamless tube resin core solder, furnished in coils in paper boxes like those for picture wire, and particularly intended for electricians' use.

Transmission Dynamometers.—The Builders' Iron Foundry, Providence, R. I. Pamphlet. This is a reprint from the Journal of the American Society of Mechanical Engineers, and it contains a paper by Prof. William H. Kenerson, Providence, R. I., describing a transmission dynamometer patented by him. It indicates by means of a pressure gauge the amount of power transmitted through it. The dial on the gauge is graduated to show the horsepower per 100 rev. per min. of the shaft to which the dynamometer is attached. An abstract of this paper appeared in *The Iron Age* May 13, 1909, in the report of the meeting of the American Society of Mechanical Engineers.

Friction Clutches.—Noblesville Machine Shop, Noblesville, Ind. Catalogue A. Booklet. Shows a friction clutch with wood split pulley attached, assembled and in sections, and gives directions for ordering.

Blowers, Ventilating and Cooling Fans and Marine Fans.—American Blower Company, Detroit, Mich. Three bulletins. Bulletin No. 253 is called "A Hand Book of Information" and gives condensed information regarding blowers and exhausters for glass factories with views of the equipment, and illustrates some glass plants where installations have been made. Bulletin No. 257 is devoted especially to ventilating and cooling fans and shows such equipment. Bulletin No. 258 treats especially of ventilation, cooling and mechanical draft on shipboard and illustrates Sirocco blowers.

Furnaces.—Rockwell Furnace Company, 26 Cortlandt street, New York. An 11 x 15 in. publication of 12 pages containing illustrations of the company's offices, plant and product. The company makes furnaces for melting, annealing, tempering, case hardening, brazing, cremating, forging and about every use to which a furnace can be put, and also builds furnaces after the customer's design.

Gas Producers.—Smith Gas Power Company, Lexington, Ohio. Bulletin No. 4. An automatic suction producer is shown erected and the various parts of the equipment are taken up separately and described. A table of the comparative costs of generating power through steam and gas engines from various kinds of fuel illustrates the advantages of producer gas. Drawings of typical producer installations are included.

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Five bulletins and two folders. Bulletin No. 4672 deals with the advantages of electric drive for printing presses, illustrates installations and describes modern methods of operation and control. No. 4673 describes the Pittsburgh, Harmony, Butler & New Castle 1200-volt direct current interurban railroad. No. 4674 is devoted to polyphase induction motors and the control apparatus for use with them. No. 4678 shows type MS 8 hood switches for electric railroad service. No. 4679 describes a new line of commutating pole constant speed motors which are made in both slow and moderate speed types. Folders 3846 and 3847 treat respectively of the voltage regulation of feeder circuits and generator circuits.

Hydraulic Wheel Presses.—E. R. Caldwell & Co., Bradford, Pa. Catalogue. Shows the Caldwell hydraulic wheel presses. Cut gears are used in this machine, operating the plunger without vibration, and the rams are faced with hardened steel and steel shoes are furnished for the faces of sliding heads. A table of dimensions of the various sizes made by the company is given and machines are shown with and without motor drive. A list of users is included.

Plate Working Tools.—Wickes Brothers, Saginaw, Mich. Catalogue A, 9¼ x 12 in. Comprehensively covers tools for use in boiler shops, shipyards and structural iron works, including plate bending rolls, frame bending rolls, engine driven steel frame bending rolls, a special bending roll with a winch for shipyard use. Motor driven bending rolls, belt driven bending rolls and some engine driven vertical rolls are also shown, together with vertical punches and shears, a 42-in. punch with jib crane attachment, angle shear, rotary shears, &c. Excellent illustrations are given of the complete machines and details of special parts.

Water Softening Systems.—Harrison Safety Boiler Works, Philadelphia, Pa. Booklet. This describes a process for softening boiler feed water at the same time that it is heated. It is pointed out that the cost of apparatus for this process is much less than the combined cost of feed water heaters and water softeners used in the cold process system. A number of illustrations of installations are given.

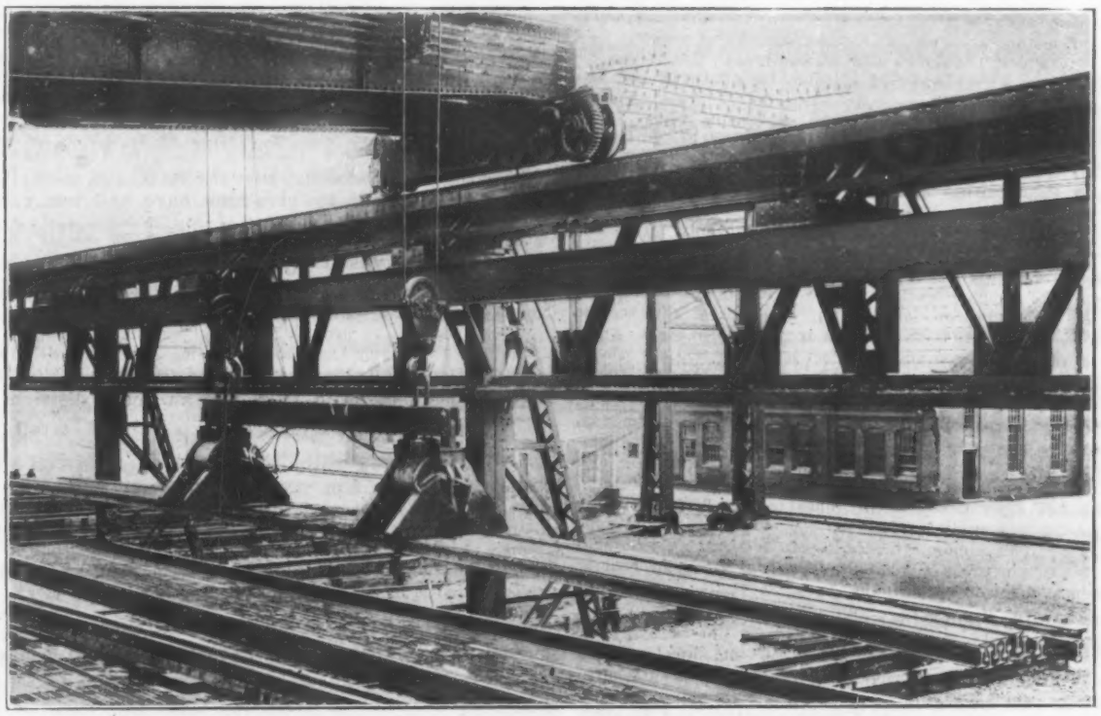
Water Glass Guards.—American Steam Gauge & Valve Mfg. Company, Boston, Mass. Two circulars. One shows a water glass guard consisting of two frames of malleable iron, swinging on hinges, attached to a bracket secured to the boiler head by studs, with side glasses of heavy plate glass with woven wire inserts. The other treats of the same subject in a different manner and lays stress on the effectiveness of the guard in preventing accidents.

Portable Autogenous Welding Apparatus.—Davis-Bournonville Company, 90 West street, New York. Pamphlet. Shows a portable oxyacetylene welding apparatus which is especially adaptable for automobile garage work. It consists of the D-B Junior welding torch, which is supplied with five tips of varying capacity, an acetylene tank, an oxygen tank, a high-pressure acetylene regulator, an oxygen regulator, hose and connections. A description of the torch appeared in *The Iron Age* July 15, 1909.

Chain Belting.—Peerless V Belt Company, 215-219 South Clinton street, Chicago, Ill. Booklet. Describes leather transmission belt with chain core for driving. The core is a V-shaped beveled link chain and the casing is composed of an upper and lower section. The latter is a continuous strip of rawhide covering the bottom and the two sides of the chain, and the upper part of the casing is a sectional strip of friction material cut at an angle so as to continue the friction surface of the sides. This belt was described in *The Iron Age* July 15, 1909.

E. C. & M. Rail Handling Magnets.

One evidence of how long it may be before the commercial value of a perfectly familiar phenomenon is appreciated is had in the case of lifting magnets. Motors and many other forms of electrical apparatus making use of the ability of electromagnets to attract to themselves pieces of iron or steel were in common use and highly developed before the simpler application of substituting them for mechanical means for picking up and holding iron and steel parts was thought of. The Electric Controller & Mfg. Company, Cleveland, Ohio, was the first to take up the designing of forms of magnets of practical utility, and since it brought out the first and simplest of these it has had many special problems to solve. One of them was the handling of hot materials; the shaping of parts and the proportioning of windings was simple compared to the providing of means to protect the parts from mechanical injury or destruction by great heat. These difficulties were overcome in the type S. A., magnet described in *The Iron Age*, December 3, 1908. More recently the company has worked out the problem of handling rails at the new rail mill of the Indiana Steel Company, at Gary, Ind.



Rail Handling Magnets in Use at the Rail Mill at Gary, Ind., Furnished by the Electric Controller & Mfg. Company, Cleveland, Ohio.

From the standpoint of the rail mills and the railroads it is desirable to ship rails in locked sections—*i. e.*, in two courses, with the rails of the upper layer inverted and their heads between the webs of the rails in the lower layer. This is an arrangement of rails that is particularly difficult to handle with a magnet, for the reason that the top layer of rails practically short circuits the magnetic field and only a very powerful and carefully designed magnet would have sufficient strength for its magnetic influence to penetrate the top layer of rails and hold the bottom layer. The magnets which are shown in the illustration, and were furnished for this particular work, have been very successful and have lifted not only locked sections of 33-ft. rails, but also locked sections of 60-ft. rails, constituting an aggregate load of 15 tons. To hold the load with stability two magnets are used and both suspended from the same trolley of an overhead crane, so that the lifted load may be transported to any part of the yard.

Among the desirable results that have followed the adoption of this means of handling rails are that sufficient labor is dispensed with to make the application commercially practicable; that a very large saving in the time of handling is effected; that there is no possibility of bending the rail when loading, eliminating loss from this source, and that much less timber spacing is necessary in loading. It seems especially appropriate at this plant, where so much is being done electrically, even to the driving of the rolls by 6000-hp. motors, that the use of electricity should have been extended to the handling of the finished product.

The National Roll & Foundry Company.

The National Roll & Foundry Company has recently been organized, with offices in the Farmers' Bank Building, Pittsburgh, and has purchased a large plant at Avonmore, Pa., formerly devoted to the manufacture of rolls and all kinds of rolling mill machinery. The president of the new company is J. B. Baird, formerly engaged in the tin plate and sheet steel business and for some years in charge of the Canton Roll & Machine Company, Canton, Ohio. R. A. McKinney, the secretary, was formerly purchasing agent of the American Sheet & Tin Plate Company. W. T. Simpson of Cincinnati, the vice-president, has been engaged in the iron and steel business in that city for some years. C. W. A. Koelkenbeck, the chief engineer, was for some years with Julian Kennedy at Pittsburgh, the Garrett-Cromwell Engineering Company, the Wellman-Seaver-Morgan Company, and more recently with the Tennessee Coal, Iron & Railroad Company. W. H. Melaney, for many years with the Geo. A. Hogg Iron & Steel Foundry Company, is also connected with the new company.

The plant consists of a foundry building, 50 x 246 ft., with two-story 40 x 150 ft. lean-to, and machine shop, 50 x 278 ft., including erecting room. The buildings are equipped with modern machinery, including two 15-ton air furnaces, two 50-ton cupolas, two 8 x 8 x 36 ft. planers, and a 7 x 7 x 22 ft. planer which will handle very large work. The company will make some improvements and expects to purchase about $20,000 worth of new machine tools. The purchases will be handled from the general offices, at Avonmore, Pa., the office in the Farmers' Bank Building, Pittsburgh, being devoted mainly to sales, &c. The improvements and additions will be made as soon as possible, and it is expected to have the plant ready for operation in September. Its melting capacity will be approximately 1000 tons per month.

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The Passage of the Tariff Bill.

In the iron, metal and allied industries the immediate effect of the passage of the Payne-Aldrich tariff bill will not be important, always excepting some comparatively smaller branches. In the great staple lines prices in this country and abroad are such that foreign competition may be disregarded as to the greater part of the country. On the Pacific slope, being most exposed, foreign makers will secure advantages, but the tonnage concerned is relatively small. When really important orders are involved domestic producers on or near the seaboard or in the Chicago District may be expected to make sacrifices to hold the business, and in that would probably be supported by the large transportation interests.

Looking to the broader aspects of the situation created by the passage of the Payne-Aldrich bill, so far as they involve possible developments, the salient point is that the reductions in the metal schedule will cut off a part of the high peaks in prices reached in boom periods. The importations of iron and steel in normal times have not for many years been large, when compared with our domestic consumption. It has only been during booms that the purchases of foreign raw materials and finished products have been important in quantity. It is true that transactions in small quantities may often affect, apparently quite out of proportion, the course of markets and of values. But it is true, too, that the very high prices quoted and paid in boom times apply to relatively small quantities. They create a very fallacious impression as to the profits realized by manufacturers and usually leave behind a trail of always distressing and sometimes disastrous readjustments. The lowering in the duties on iron and steel will in the future act earlier in checking unusual upward movements, which the majority of those who are engaged in the iron industry as a lifework have always deplored.

Improvements in the metallurgy of iron and steel, and particularly greater economy of fuel, and the utilization of waste products have had the effect of creating more favorable conditions for tidewater works both in this country and abroad. The duty on iron ore has been one factor so far as our Atlantic Coast is concerned, although only one factor. The prestige of Pittsburgh and the lake cities has been a very much more powerful deterrent to investing capital in coast iron works. But while it is being understood more and more that low costs may be reached, quite apart from any duties on raw materials, there is little doubt that the lowering in the duty on iron ore will stimulate courage and may lead to an earlier development of important tidewater iron industries.

Demurrage on Delayed Shipments.

Nearly all the friction between shippers and railroad agents or officials over demurrage charges grows out of cases where cars have been delayed in transit. If a rule could be devised, or an amendment made to existing rules, which would work automatically in allowing the consignee a reasonable time on delayed cars, demurrage bills would seldom be a source of irritation and trouble to the average shipper. Many of the State railroad commissions have established rules allowing additional time when cars are bunched, but while these rules save the shipper a little money, much trouble occurs in their application, as they do not harmonize with the routine methods of railroad management.

It would be very desirable from all points of view if the shipping interests and the carriers of the country could meet in conference in devising some method of handling delayed shipments that would cover the needs of both parties. The standard code of rules now generally followed by car service associations or demurrage bureaus has been framed by railroad men, who necessarily look at the question from their point of view. The rules of the State commissions, on the other hand, have been framed by men who have had less experience than the high oprating officials of the carriers, who do not take kindly to legal regulation of so delicate a question. In the Pittsburgh and Cleveland districts there has been more co-operation than elsewhere between shipping and railroad interests, and as a result there is less friction in proportion to the difficulties to be surmounted. The industries in these districts receive large and irregular consignments of scrap and other materials, which they buy in the open market at irregular times, creating a peculiar difficulty for the consignees as well as for the carriers. The "industrial rule," which has long been in force, exempts an industry from demurrage as long as it unloads 50 per cent. more than its average or rated capacity. This rule has given general satisfaction in handling the most troublesome and congested traffic in the United States, and it goes to show that a vast amount of irritation might be eliminated by co-operation along the same line between carriers and industrial interests.

The proposal has been advanced by industrial experts that a very simple amendment to existing rules would protect the average industrial shipper or merchant against demurrage on delayed shipments. The consignee should pay no demurrage on a delayed car as long as he uses reasonable diligence and employs his full crew of warehouse or yard men, or his regular drays, in the work of unloading. The books of every industry and every mercantile house show how many cars are unloaded in a day when the full crew of men employed for that purpose is at work, and the records of the railroad show the same facts. The billing of a car shows the time it has been in transit, and if there is any question regarding the date of shipment the bill of lading or receipt given to the shipper is conclusive. Under this proposed rule or amendment a car should be considered delayed when it has failed to make an average of a certain number of miles per day, and the consignee should be exempt from demurrage so long as he uses his full regular facilities, and should not be required to unload the delayed car until he has cleared up cars that have arrived in regular time.

If a car gets in bad order in transit and is delayed

for repairs the fault lies with the railroad. The consignee is kept out of the use of the goods and should not sustain any further hardship. If the railroad has become congested by lack of facilities to handle its traffic in reasonable time the shipper suffers loss by the delay. The law presumes that the company shall have ample facilities to handle its traffic and does not justify the imposition of additional charges because of its own failure to perform its service as a common carrier. If the car has been delayed by discrimination in favor of other traffic, the most common cause of delay, the case of the consignee is still stronger.

It is commercially and economically impossible for a railroad to forward all its traffic at a uniform speed every day in the year, even when there are no accidents or storms to interfere with the movement. Commodities like grain, cotton or scrap move in irregular waves, depending upon market conditions; while other commodities like coal vary in movement according to the weather. Business economy in managing a railroad requires that train crews shall be given as regular employment as possible. They are paid by the mile or trip, and the law limits the number of hours they can work in a day, so that, as a rule, they can only make one run over a division in a day. The men must have experience, and to attract the best class of men for the wages that can be paid it is necessary to give them regular work. These conditions limit the number of cars that can be forwarded over a railroad in a day. The traffic, however, comes more or less in waves, and when more cars are offered in a day than the train men can handle some cars must wait. If enough crews were available to handle the heaviest periods or waves they would be idle during the recessions of traffic and this would reduce their monthly earnings or force the railroads to pay wages for the time they are idle. This condition is the great cause of delays in transit.

It is the universal custom of American railroads to let raw materials and low class freight bear the brunt of delays. Preference in movement is given to high class freight, which yields more revenue per car, while raw materials and the lower forms of industrial freight are forwarded as rapidly as the regular operating force can take care of them. The rules permit cars loaded with some commodities to stand five days in one division yard, while higher class freight is given preference; and similar rules regulate the repair of cars in bad order. The law does not justify or sanction this discrimination in handling non-perishable freight, but from a reasonable business point of view it is no doubt justifiable, especially since bulk commodities are handled at lower rates than would be possible if they had to be forwarded on schedule time like fast freight.

The point in this discussion is that if it is economical for the railroad to hold back some cars, while preference is given in movement to others, the consignee whose cars are delayed in transit should have some consideration shown him when his shipments arrive in irregular order. Probably nine-tenths of the delays of commodity freight in transit result from these operating rules of the carriers, devised and followed for economy in handling the traffic. If the railroads save the expense of employing additional crews by holding cars in transit for days or weeks in their yards they should not hold industrial shippers to the same hard and fast demurrage rule that may be enforced against brokers or merchants who use cars as warehouses for unsold commodities.

Some of the State legislatures and commissions have taken the extreme view that the railroad should pay demurrage to the shipper when a car fails to make 50 or 60 miles per day, but this idea has not received the general support of conservative industrial interests, and the rules embodying it are strongly contested in the courts by the railroads. If such a rule were enforced in interstate commerce it would disturb seriously the economy of operation of the railroads. A more moderate course would be to allow the consignee the same privilege the railroad now exercises by giving him a reasonable time to release delayed cars. This course has long been followed on many of the best managed railroads.

A New Purpose of the Premium System.

A manufacturer of machinery advances the premium system as a means to counteract the efforts of the great employers of mechanics to secure the pick of men from smaller industrial plants. In prosperous times the automobile and allied industries, the great electric shoe machinery and textile machinery companies and others seek to augment their forces by attractive offers to workmen in other localities, the practice in many cases being conducted in a systematic and effective manner. Larger wages is the usual inducement. The argument in favor of a premium system as a means of overcoming this is that fewer men are required to accomplish a given production as compared with the ordinary wage system, and also that workmen earn more money and are the less likely to yield to the inducements of those who would hire them away.

The piece work and premium systems are similar in certain respects, particularly in the fact that a man's earnings depend on the amount of work he turns out. With either the employer must go carefully in determining his price at the outset and still more carefully in reducing it. Some works are known among workmen as having a well defined limit which they will permit a man to earn, and every employee strives to produce a maximum without coming too near the danger point, at which the price is certain to be cut. Many employers of labor do not realize this condition. They believe that their people are producing at maximum capacity, whereas the fact is that a strict adherence to an original piece price, or a time rate and premium rate under the premium system, with the policy well known among employees, would mean a very rapid advance in production. Machines would go faster; no time of men or mechanism would be wasted; better methods would be evolved. Under the piece work system the man would earn more; so would the employer, because his overhead expense would have a larger divisor. With the premium system the owner gains both ways, dividing the saving, where the workman cuts down the time allotted to the production of a given number of pieces, and receiving all the benefit of the more extended distribution of the overhead. If the workman reduces the time allowance 50 per cent. (which is no impossible result in the experience of those who have tried the system, though it may indicate a mistake in rate fixing) the machine produces twice as much in a day, while the employer divides the time saved with his workman. The employee's earnings increase to such a degree that no ordinary offer of employment elsewhere would be at all attractive.

The manufacturer previously referred to presents two instances in connection with the argument, both of them recent, to illustrate the diametrically different manner in which employers regard the working of these systems. Visiting the works of a user of one of his ma

chines, he was asked what product should be obtained from it and replied that 20 pieces an hour would be a minimum. The customer then related his experience. He had a so-called cheap man on the job, to whom he was paying $1.50 a day, in which time the machine was turning out about 100 pieces. Believing this too small an output, the employer offered the man a cent a piece for the work. Production then climbed rapidly, and finally reached 250 pieces. The workman had increased his daily earnings from $1.50 to $2.50. "I couldn't stand for that," said the customer. "He wasn't worth it, and I cut him. No, he didn't stay. He threw up the job." His successor is turning out 125 pieces. The employer had been paying 1½ cents under the hourly wage system; had put the man on piece work and reduced the cost to a cent, at the same time much more than doubling the capacity of the machine, and he had then further cut the piece price, slaying the layer of the golden eggs.

The other incident occurred in the shop of the manufacturer himself. Asked to take a contract for doing the milling on a large lot of automobile crankshafts, a trial hundred were first put through the works. The operator selected for the task was receiving $2 a day, but in talking over the contract with the purpose of fixing a piece price wanted to earn a larger wage, believing himself worth $2.50. He thought he could mill 20 shafts daily, and agreed to a piece price of 8 cents, the employer's idea being that the man would probably produce more than enough to net him $2, and probably, by hard work, would reach the desired $2.50. The result was that production increased swiftly, until 40 a day were obtained. New cutters being furnished him at his own suggestion, the rate became 45 a day. The man was earning $3.60, but the employer was also the gainer, because his machine was released for other work some days earlier than would have been the case if the job had been done by the hour, and the overhead cost of the contract was correspondingly smaller. Under a premium system the saving would have been even more pronounced. The difference in the outcome of the two incidents points an industrial moral.

The Steel Business of 1909 and Its Distribution.

The mooted question how far the heavy reductions in prices of steel products made in February and the few months following increased their consumption is one to which a definite answer cannot be made. Another matter on which views have differed relates to the percentage of low priced business taken by the United States Steel Corporation in the particularly sharp competition prevailing in the spring months of this year. There has been an impression that some of the subsidiaries of the Steel Corporation secured more than their accustomed proportion of the contracts closed in the particularly active period covered by April, May and June, and before prices had advanced measurably. On the other hand, some market developments sustained the view that the competitors of these companies quite held their own in the stress of that competition. The Steel Corporation's statements of output of various finished products are made up by calendar years, as are also the statistics of the American Iron and Steel Association for the whole country. The only information now available is that furnished by the pig iron statistics of the first half of the year.

The interesting fact was brought out in these columns last week, by a comparison of blast furnace figures, that steel making pig iron did not make up quite so large a percentage of the country's total pig iron production in the first half of 1909 as in any one of the three full years preceding. A question was raised, therefore, as to the correctness of the general opinion that the cuts in finished steel prices had resulted in much greater activity in steel works products than in those of the foundry and the iron rolling mill. To make an accurate deduction on this point it would be necessary to know how the production of the two broad classes of pig iron—steel making pig iron and all other—compared with their consumption in the first six months of the year. The steel works stocks of pig iron were reduced in the first half, it is known, and it is also known that stocks at many merchant furnaces producing foundry and forge iron were larger on June 30 than at the beginning of the year. On the other hand is to be considered the fact that of the merchant furnace output of Bessemer and basic iron in the first half of the year there was also some accumulation of stocks. The production figures taken alone showed that steel making pig iron was but 71.2 per cent. of the total in the first half of 1909, as against 73.3 per cent. in the full year 1908, 73.4 per cent. in 1907 and 75.7 per cent. in 1906. It would thus appear that a greater accumulation of nonsteel making pig iron than is generally understood took place in the first half of 1909, or a greater reduction of stocks of steel making irons, to justify the belief that steel products were relatively far more active in that period than were the products of foundry and forge irons.

As to the relative activity of the mills of the Steel Corporation and those of other steel companies having their own blast furnaces the statistics give approximate information. The percentages below represent in the first column the Steel Corporation's share of the country's total pig iron production in the first half of this year and in the full years 1908 and 1907, while in the second column are given the Steel Corporation's share of the pig iron output of all steel works furnaces in the same period:

United States Steel Corporation's Proportion of Pig Iron Production.

	Per cent. of total pig iron for United States	Per cent. of steel works pig iron.
First half 1909	42.4	66.3
Year 1908	43.5	68.3
Year 1907	44.3	71

Here again the factor of stocks must be reckoned with, but the production percentages given more closely represent relative consumption, since all steel companies reduced their stocks of iron in the first half of 1909, and with all of them production in that period, particularly in the second quarter, was gauged to enlarging consumption. The Steel Corporation, with its new furnaces at Gary, Youngstown and Duquesne, might be expected to show a larger percentage of the country's pig iron production, and certainly of the total pig iron production of the steel companies, than in 1908 and 1907. That the Corporation did not reach its percentages of 1908 and 1907 suggests that some of the estimates which give it an unusual preponderance in the finished steel business of 1909 require revising.

The Wm. Tod Company, Youngstown, Ohio, has received an order for a low pressure 96-in. long cross head blowing engine for the Struthers Furnace Company, the order calling for shipment within 30 days. This short delivery is possible through the fact that, during the dull times, the Wm. Tod Company built several of its standard blowing engines for stock, so that the Struthers engine can be shipped immediately.

CORRESPONDENCE.

The Approaching Brussels Exposition.

To the Editor: I wish to make an appeal to our people to take a deep interest in the Brussels Exposition of next year. In 1905 I was a delegate to the International Congress of Boards of Trade which convened at Liege in Belgium, where a very successful exposition was being held, about which everyone seemed to know except the people of this country. The entire British Chamber of Commerce attended in a body. The delegates were shown many courtesies, but those of us from the United States felt chagrined to see how ridiculously insignificant our exhibits were. Our neighbor Canada had a special building of no mean proportions filled with her products. We had next to nothing, and the Belgians did not quite understand it. This vigorous young nation, that was reported as striking out for the markets of the world, was she afraid to show her wares alongside those of her foreign competitors? Japan had practically the same show that she made at St. Louis.

If the exposition proposition is a good one, and the foreigners seem to think it is, judging from the number of such attractions they have, it will pay us to take advantage of it to let the buyers of the world see what we have to offer. As I write, the old jingle of earlier days comes to me of

> Simple Simon met a pieman
> Going to the fair.
> Said Simple Simon to the pieman,
> "Let me taste your ware."

Whether he smacked his lips and said t'was sweet, old Mother Goose never told us, but she did impress the great truth that the buyer, no matter how "simple," wants to sample the goods.

As one travels from Brussels to Cologne the tall factory chimneys flank the railroad like so many of Frederick's grenadiers. And right good fighters they are to-day in that commercial warfare which teaches the consumer in far Timbuctoo to understand "made in Germany" before he does his mother tongue. It is safe to say these producers will show up strong at Brussels and it will take our best to compete with them favorably.

It is to be hoped that some co-operative plan may be evolved for diminishing the expense of individual exhibits in foreign lands. We might get a suggestion from Stockton's amusing story of the Great War Syndicate, which tells of a contract made by our country, after declaring war with Great Britain, which placed its entire management in the hands of a corporation. This is carried out successfully with honor and no pensions to pay. Perhaps an "exhibiting corporation" which would undertake to install and care for goods during the term of an exhibition would afford our manufacturers an economical and attractive method of displaying their goods through responsible parties.

But certainly our big concerns can well afford to do the handsome thing at Brussels next year, and it is with the hope of stirring up some interest in the subject that I have asked the publicity of these few lines.

MORRIS B. BELKNAP,
VICE-PRESIDENT, BELKNAP HARDWARE & MFG. COMPANY.
Louisville, Ky., July 30, 1909.

Stanley G. Flagg & Co., 424 North Nineteenth street, Philadelphia, Pa., announce that during the past two years they have been steadily improving and enlarging their foundry plant at Stowe (Pottstown), Pa., so that they might finally transfer all their manufacturing to those works. They believe that the plan is so far completed as to make it advisable to take active steps toward the closing of their Philadelphia foundry and to concentrate that branch of their business at the new plant. During the long period of occupation of the Philadelphia plant they have accumulated a very large number of patterns, which are the property of their customers, and a great quantity of them are obsolete and worthless. They ask that customers owning the latter shall give instructions leading to their disposal.

The Harriman Rail Specifications for 1909.

The specifications of the Harriman lines for 90 lb. Bessemer and open hearth rails for 1909 present some differences from those of the engineering societies and the American Railway Association as well as of the manufacturers. The *Railroad Age Gazette* says of them: "These lines are buying only 90-lb. rails this year for main line service. The plan advised by the American Railway Association of marking the rails A, B, C, D, &c., according to their position in the ingot, starting from the top, has been adopted in these specifications. By excluding the top, or A, rails from main line use, the effect of an additional 30 per cent. discard is obtained, and at the same time the discard is saved for use on sidings and other locations where second-hand rails usually are used. The roads are thus doing their own discarding beyond the manufacturers' allowance and saving the product without risk to the quality of the main-track rails."

The higher carbons of the Harriman specifications are noteworthy. While the manufacturers' specifications provide 0.43 to 0.53 carbon and 0.10 per cent. phosphorus for 81-lb to 90-lb. rails and the American Railway Association calls for 0.45 to 0.55 per cent. carbon and 0.10 per cent. phosphorus for 90-lb. rails, the Harriman lines specify 0.55 to 0.65 per cent. carbon and 0.085 per cent. phosphorus and stipulate that where mills cannot furnish Bessemer rails with a phosphorus content less than 0.10 per cent. the carbon shall be 0.50 to 0.60 per cent. The Harriman requirements for open hearth rails also provide for a higher carbon range and higher manganese than do the manufacturers' specifications. The latter give a carbon range for 90-lb. rails of 0.59 to 0.72 per cent., with manganese 0.60 to 0.90 per cent. The Harriman range is 0.63 to 0.76 per cent. on carbon and 0.70 to 1.00 per cent. manganese. Since an open hearth heat represents several times as much metal as a Bessemer blow it is stipulated that two pieces of rail from each melt shall stand the drop test. Three test pieces are selected, 4 to 6 ft. in length, and the drop is 17 ft. "Both of these test pieces shall be tested, and if both meet the requirements, all the rails from the melt which they represent shall be accepted, provided they conform to the other requirements of these specifications. Should both of these test pieces fail all rails from the melt will be rejected. Should either of these test pieces fail, the third shall be tested, and if this third test meets the requirements all the rails from the melt shall be accepted, provided they conform to the other requirements of these specifications. Should the third test fail, all the rails from the melt shall be rejected."

The Cooper Engine.

The C. & G. Cooper Company, Mount Vernon, Ohio, has developed and is now building a line of large gas engines of the horizontal, twin tandem, 4-cycle double acting type, in addition to its Corliss engine business. These engines are being built in sizes ranging from 400 to 5000 b.h.p. and are especially adapted to the use of blast furnace and by-product gases. Several distinctive features of construction have been developed with the idea of simplicity, accessibility and uniformity in all parts and the ability to make long runs and give continuous and reliable service.

The Cooper Company reports the recent sale of a gas engine driven gas compressor to the Wheeling Natural Gas Company, Pittsburgh, to be installed in one of the latter company's pumping stations near Wheeling, W. Va. This engine is to be of the horizontal, twin tandem, double acting type, driving gas compressors for the long distance transmission of natural gas. In the Corliss engine department, business continues to increase. An order has recently been received from the Jones & Laughlin Steel Company for a 34 & 60 x 60 in. twin tandem Corliss rolling mill engine, to drive the new tin plate at its Aliquippa Works, and another order from the same company covers a 30 & 56 x 48 in. Corliss rolling mill

engine to drive its continuous billet mill at its South Side works.

Specifications for Cast Iron Car Wheels.

Below are given the specifications for 33-in. cast iron car wheels adopted at the convention of the Master Car Builders' Association, Atlantic City, N. J., June 21-23, 1909, and now to be submitted to letter ballot. They differ from those of the American Society for Testing Materials, adopted in 1905 and in general conforming to the then existing specifications of the railroad engineering associations, in a number of particulars, though in no important way. The former covered wheels for 60,000, 70,000 and 100,000 lb. freight cars, while the latter substitutes 80,000 lb. for 70,000 lb. cars. While in the earlier specifications 600, 650 and 700 lb. wheels were called for for the three classes of cars, respectively, with an allowable variation of 2 per cent., the minimum weights now required are 615, 665 and 715 lb., respectively, with the maxima 10 lb. above these figures. Excessive weight is not a cause for rejection now as before, but the manufacturer will not be paid for weight above the maximum. The minimum depth of chill in the throat has been slightly increased, and the provision as to variation in depth of white iron around the tread on the rail line is new. The drop and thermal tests are little changed, the former being adapted to the new weights of wheels. The first paragraph of section 4 in the specifications below shortens the corresponding section in the American Society for Testing Materials requirements and eliminates from the latter the provision that "for any single inspection and test only wheels having three consecutive shrinkage or stencil numbers will be considered."

Specifications for 33-In. Cast Iron Wheels for Cars of 60,000, 80,000 and 100,000 Lb. Capacity.

1. Chills must have an inside profile that, in the finished wheel, will produce the exact form of flange and tread contour shown by M. C. B. drawings adopted in 1909. The normal diameter of the wheel produced by the chill must be the M. C. B. Standard of 33 in., measured at a point 2⅝ in. from outside of tread of wheel.

2. Wheels furnished under this specification must not vary more than ¼ in. above or below the normal size "measured on the circumference," and the same wheel must not vary more than 1-16 in. in diameter. The body of the wheel must be smooth and free from slag, shrinkage or blowhole. The tread must be free from deep and irregular wrinkles, slag, chill cracks and sweat or beads in throat, and swelled rims.

3. The wheels must show clean gray iron in the plates, except at chaplets, where mottling to not more than ½ in. from same will be permitted. The depth of pure white iron must not exceed 1 in. nor be less than ½ in. in the middle of the tread.

(A) It shall not exceed 1 in. in the middle of the tread nor be less than ⅝ in. in the throat, for wheels having a maximum weight of 625 lb.

(B) It shall not exceed 1 in. in the middle of the tread nor be less than 7-16 in. in the throat for wheels having a maximum weight of 675 lb.

(C) It shall not exceed 1 in. in the tread nor be less than ½ in. in the throat for wheels having a maximum weight of 725 lb.

(D) The depth of white iron shall not vary more than ¼ in. around the tread on the rail line in the same wheel.

4. When ready for inspection, the wheels must be arranged in groups, all wheels of the same date being grouped together, and for each hundred wheels which pass inspection and are ready for shipment two representative wheels shall be taken at random, one of which shall be subjected to the following tests:

The wheels shall be placed flange downward on an anvil block weighing not less than 1700 lb., set on rubble masonry at least 2 ft. deep and having three supports not more than 5 in. wide to rest upon. It shall be struck centrally on the hub by a weight of 200 lb.

(A) For wheels having a maximum weight of 625 lb. 10 blows falling from a hight of 9 ft.

(B) For wheels having a maximum weight of 675 lb. 12 blows falling from a hight of 10 ft.

(C) For wheels having a maximum weight of 725 lb. 12 blows falling from a hight of 12 ft.

Should the test wheel stand the given number of blows without breaking in two or more pieces, the inspector will then subject the other wheel to the following test:

The wheel must be laid flange down in the sand, and a channel way 1½ in. wide and 4 in. deep must be molded with green sand around the wheel. The clean tread of the wheel must form one side of the channel way, and the clean flange must form as much of the bottom as its width will cover. The channel way must then be filled to the top with molten cast iron, which must be hot enough when poured so that the ring which is formed when the metal is cold shall be solid or free from wrinkles or layers. The time when the pouring ceases must be noted, and two minutes later an examination of the wheel must be made. If the wheel is found broken in pieces, or if any crack in the plate extends through or into the tread, the 100 wheels represented by the tests will be rejected.

5. In the drop tests, should the test wheel break in two or more pieces with less than the required number of blows, then the second wheel shall be taken from the same lot and similarly tested. If the second wheel stands the test it shall be optional with the inspector whether he shall test the third wheel or not; if he does not do so, or if he does, and the third wheel stands the test, the hundred wheels shall be accepted as filling the requirements of the drop test.

6. The lower face of the weight of 200 lb. shall be 8 in. diameter and have a flat face.

7. The thickness of the flange shall be regulated by the maximum and minimum flange thickness gauges adopted by the M. C. B. Association in 1907.

All wheels furnished under this specification must conform to the respective sections shown by M. C. B. drawings for the different weights of wheels, and these weights shall be as follows:

(A) Wheels for service under 60,000 lb. capacity cars shall have a maximum weight not exceeding 625 lb. and a minimum weight not less than 615 lb.

(B) Wheels for service under 80,000 lb. capacity cars shall have a maximum weight not exceeding 675 lb. and a minimum weight not less than 665 lb.

(C) Wheels for service under 100,000 lb. capacity cars shall have a maximum weight not exceeding 725 lb. and a minimum weight not less than 715 lb.

(D) Weights given for the respective wheels mentioned in sections A, B and C are based on M. C. B. Standard drawings covering wheel design adopted in 1909.

8. All wheels must be numbered consecutively in accordance with instructions from the railroad company purchasing them, and must have the initials of such railroad company, also the wheel number, the weight of wheel, and the day, month and year when made plainly formed on the inside plate in casting. No two wheels shall have the same number. All wheels shall also have the name of the maker and place of manufacture plainly formed on the outside plate in casting.

Wheels conforming to the requirements and furnished under this specification must have the letters "M. C. B., 1909," plainly formed on the outside plate in casting.

9. Individual wheels will not be accepted which

(1) Do not conform to standard design and measurements.

(2) Are under minimum weight. All excess weight over the maximum given to be at the expense of the manufacturer.

(3) Have physical defects described in section 2.

Any lot of 100 wheels submitted to test will not be accepted

(1) If wheels broken do not meet the prescribed drop test.

(2) If the wheel tested does not stand the thermal tests.

(3) If the conditions prescribed in section 3 are not complied with.

10. All wheels must be taped with M. C. B. Standard design of wheel circumference tape having numbers 1, 2, 3, 4, 5 stamped ⅛ in. apart, the figure "3" to represent the normal diameter, 103.67 in. circumference; the figure "1" the smallest diameter and the figure "5" the largest diameter.

Cincinnati Continuation Schools.—The opening of the continuation schools as a part of the regular Cincinnati public school system will occur the first week in September. J. Howard Ranshaw, of the Cincinnati Milling Machine Company and formerly a public school and Ohio Mechanics' Institute teacher, will be the appointee instructor. Apprentices and other employees of the shops will receive a regular course of training in educational matters along with shop training at their various places of employment, employers paying them for the time spent in class study the same as if they were at their tools or benches in the shops.

The Berger Mfg. Company's Growth.—As a result of action taken at a recent meeting of the stockholders of the Berger Mfg. Company, Canton, Ohio, the capitalization of that company has been increased from $2,000,000 to $5,000,000. The purpose of the increase is to provide for additions, extensions and improvements to keep pace with the growing demand for the company's products. The Berger Company is now building a large addition, which is near completion, which will be occupied by the galvanizing plant and for warehouse purposes. Other additions are under consideration and may be built during the present year.

A fuel testing plant is now being erected at Ottawa, Canada, in which the value of peat for the production of power gas will be demonstrated, and the Department of Mines of the Canadian Government proposes to carry on a very thorough investigation of this subject.

Workmen's Accident Compensation.

Government Regulation Becoming a Live Question.

At the twenty-second convention of the International Association of Accident Underwriters, held at Niagara Falls, Canada, July 13 to 16, a paper entitled "Facing the Situation" was presented by S. H. Wolfe, which deals with the apparent tendency of the times as to the protection of the interests of injured workmen. The paper is in part as follows:

For several years the leaders of the various governments have realized that a government has some duty to perform to its working classes other than the mere maintenance of law and order. The law of supply and demand which regulates most things is a doctrine not applicable to the price of labor. The anxiety of the laborer to obtain employment leads him to dispose of his services at a price insufficient to provide for his present needs and to lay aside a sum to take care of him during his unproductive periods. This inability to provide may arise from old age, the ravages of disease or the effects of an accident.

Call this idea paternalistic if you will, but the fact remains that it forms the basis for the remedies applied by every government which has seriously considered the question. For too long a time have we been assuming that the ultimate destiny of the working man is something which we must leave for him to work out; to-day a new doctrine seems to be accepted, namely, that the wear and tear of the employee must, like the wear and tear of the machinery, be considered as a part of the cost of production, and as such met by the consumer.

With this fact before them, the different nations have handled this question in different ways. In Germany they seem to have been more successful in dealing with this responsibility in a scientific manner than in other countries.

How Germany Handles an Accident.

It may not be uninteresting to follow the history of an accident there. The employers are grouped according to the kind of business transacted. A workman is injured; no question of contributory negligence is raised; the doctrine of the responsibility of the fellow servant is not invoked; no lawyer is hired and none of the aggravating delays of the law are experienced. Automatically and with the regularity of a well oiled machine, the particular association to which the employee belongs pays to the injured workman certain benefits. He may have free medical treatment and receive in addition thereto 50 per cent. of his average daily wages, or he may go to a well conducted hospital where he will be treated free of charge and while he is there his family will receive one-quarter of his average daily wages.

This continues for 13 weeks, should the effects of the accident last that long, and the payment is made from a fund to which the employer contributes one-third and the employees two-thirds. After the 13 weeks have elapsed, the relief is furnished from the funds of another association, the contributions to which are made solely by the employers and are based upon the payroll and the hazardous nature of the particular occupation. Not only does the injured man continue to receive free medical treatment, but also a pension according to a sliding scale, the maximum being two-thirds of a year's earnings. Should it be necessary for him to be confined in a hospital he receives the benefit of free treatment in an institution and his family receives assistance, the maximum amount of which is about 60 per cent. of the yearly earnings. All accidents are paid for unless it can be shown that the disability is due to some intentional act on the part of the working man.

In addition to the foregoing there are burial benefits provided for, usually amounting to 20 times the daily wages, and in the case of severe accidents there is a pension given to the surviving members of the family under certain restrictive conditions.

I have already referred to the automatic nature of this method of protection, and have also mentioned the fact that its benefits are enjoyed as a matter of right and not as the result of any recovery in a protracted action at law. Foreseeing that questions, disagreements and disputes were bound to occur, the German Government has laid down rules for their settlement. With a care and attention to details of administration so characteristic of the German people, an elaborate system of Government jurisprudence has been insisted upon. The associations which furnish the funds for sickness insurance and for the first 13 weeks of accident insurance retain their own administrative functions. The associations which provide for accident benefits from the fourteenth week on are administered by the employers under the supervision of the Imperial Bureau. Realizing, however, how necessary it is to have the co-operation of the employees in investigating accidents, representation from that body has been provided for.

Should the insured be dissatisfied with the decision on any question which has been given by the local institution, he has the right to appeal to an arbitration court and after that to the Imperial Insurance Bureau. It would be a refreshing experience for some of the learned judges in this country to witness the procedure in one of these courts. Legal forms and quibbles are swept aside in an honest endeavor to ascertain the true conditions surrounding the incident, and once that has been accomplished justice in its most elementary and purest form is rendered. The parties interested appear personally before the tribunals, and it is unnecessary to retain attorneys for the purpose of representation.

Two Important Features of the System.

There are two features of this system to which I would like to particularly direct your attention. I refer to the encouragement of the installation of the most improved forms of machinery and safety devices for the protection of the life, limb and health of the working man. It is a peculiarity of human nature (at least in our present undeveloped stage) that we are appealed to more readily from the selfish standpoint than from the ethical. While a German employer might realize that his responsibility to mankind requires that he shall install the safest form of machinery, he might defer the purchase of such improvements until his profits were larger, or until he had done the hundred and one things which under the circumstances are considered legitimate excuses for delay. But let that employer realize that when an accident occurs the circumstances surrounding it will be rigidly investigated and that if any blame can attach to him he will be fined heavily for the disbursements which have been incurred by his association, the chances are that he will immediately realize that good business principles will dictate the necessity for an immedate installation of the best safety devices.

The other point is one to which I have already alluded —the fact that these remedies are applied with no delay and without the necessity of appeal to the courts. At first blush it might be assumed that this would lead to the filing of false claims, malingering and to an excessive loss ratio, but it would seem that this contingency has been cleverly guarded against, for you will recall that the benefits during the first 13 weeks are payable from the funds of an association to which the employee contributes more than the employer does. The employee is thus brought face to face with the pertinent fact that for every 100 cents of unnecessary benefits which are disbursed he is paying 66 cents, and this is a most potent agument for the prevention of improper disbursements.

I have outlined one phase of the system now employed in Germany. We find similar systems, with modifications, however, in force in Switzerland, Austria, Hungary, France and other countries. The day when some idea of this kind will find lodgment in this country is not far distant.

While listening to these remarks you may have wondered what possible application they could have to you and how you and your corporations will be affected by this idea. I am of the opinion that the system of governmental insurance is in its infancy and upon the present base will be reared a huge structure. When that time comes protection by private corporations will be critically

weighed, and if its defects are such as to indicate the advisability of having this important political and economic function placed in the hands of the government it will be done.

June and the Fiscal Year Iron and Steel Exports and Imports.

The June report of the Bureau of Statistics of the Department of Commerce and Labor shows a quite satisfactory gain in exports of iron and steel in that month as compared with May. A trifling increase was made in the imports. The value of the total exports of iron and steel and manufactures thereof, not including ore, in June was $13,779,736, against $12,993,197 in May. The total value of the same class of imports in June was $2,461,910, against $2,244,600 in May.

The exports of commodities for which quantities are given again show an increase. The total exported in June was 114,751 gross tons, against 109,977 tons in May, 100,904 tons in April, 94,523 tons in March, 84,860 tons in February and 70,085 tons in January. The exports of heavy products have thus increased continuously from month to month since the opening of this year. The details of the exports of these commodities for June and for the whole of the fiscal year ending with June are as follows:

Exports of Iron and Steel.

	June,		12 months ending June,	
	1909.	1908.	1909.	1908
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	7,846	4,906	50,178	52,518
Scrap	7,837	1,991	29,030	20,518
Bar iron	1,089	622	11,179	13,065
Wire rods	1,519	462	12,715	6,534
Steel bars	7,206	3,022	52,667	63,128
Billets, blooms, &c.	10,574	5,583	109,331	92,893
Hoop, band, &c	235	274	3,448	8,560
Steel rails	20,813	15,759	234,128	278,867
Iron sheets and plates	7,631	3,124	58,658	42,024
Steel sheets and plates	8,471	3,881	79,231	60,508
Tin and terne plates	630	113	5,094	15,010
Structural iron and steel	8,999	8,417	101,653	134,299
Barb wire	7,137	10,420	67,299	156,960
Wire	9,681	10,420	73,270	156,960
Cut nails	935	528	8,014	6,481
Wire nails	2,434	1,234	26,784	35,541
All other nails, including tacks	583	491	6,671	5,774
Pipes and fittings	11,131	8,956	129,444	168,591
Totals	114,751	80,203	1,058,794	1,318,231

The imports of commodities for which quantities are given totaled 19,402 gross tons in June, against 18,352 tons in May, 17,772 tons in April, 20,714 tons in March, 19,418 tons in February and 19,782 tons in January. The imports of these articles have been inconsequential for the whole of this year. Details of such imports for June and for the fiscal year ending with June are as follows:

Imports of Iron and Steel.

	June,		12 months ending June,	
	1909.	1908.	1909.	1908.
	Gross tons.	Gross tons.	Gross tons.	Gross tons
Pig iron	10,623	9,341	104,655	204,092
Scrap	50	537	5,182	17,614
Bar iron	815	859	14,914	32,504
Rails	....	206	1,292	2,839
Hoop, band, &c	46	2	1,259	474
Billets, bars and steel in forms n.e.s	1,103	1,099	12,672	16,500
Sheets and plates	189	246	3,168	2,623
Tin and terne plates	5,647	7,650	52,372	62,830
Wire rods	838	1,181	11,358	13,571
Structural iron and steel	91	61	5,475	1,530
Totals	19,402	21,182	212,347	354,577

The imports of iron ore in June were 124,714 gross tons, against 97,393 tons in May, 74,782 tons in April, 108,676 tons in March and 61,749 tons in February. The total imports of iron ore for the fiscal year ending with June were 1,015,647 gross tons, against 958,378 tons in the fiscal year 1908 and 1,096,717 tons in the fiscal year 1907.

The total value of the exports of iron and steel and manufactures thereof, not including ore, in the fiscal year ending with June, was $144,951,357, against $183,982,182 in the fiscal year 1908. The imports in the same periods were respectively $22,439,787 and $27,607,909.

The New York Central's Improved Freight Carrying Facilities.

Talking of improvement in railroad traffic, President W. C. Brown of the New York Central Railroad recently said:

"In 1907, from July to October, we had constantly 5000 to 6000 loaded cars destined for either the Boston & Albany or the Boston & Maine set out on side tracks between Syracuse and Albany. This year there isn't a car set out, although for several weeks we have been handling as heavy traffic as we did then. Even supposing that we had only the same rolling stock and motive power, we could handle 20 per cent. more traffic this year than then without feeling the increase in the least. We have about 4000 idle cars on the line now. Of course, those might be licked up in a day, but we have 5000 additional cars under order, coming from the makers as fast as they can turn them out. But the greatly increased capacity is due almost entirely to additional running and passing tracks, sidings and the like, especially on the Boston & Albany. On that line a third track has been laid on every grade, so that freight trains move continuously without stopping for passenger traffic, while passenger traffic also moves without interruption. The reduction of grades and double tracking on the West Shore, between Rochester and Buffalo, will give us a freight line with lower grade than on the Central's main line, and will practically complete a six-track road between Buffalo and Albany."

New Publication.

The Naval Pocketbook. Edited by G. S. Laird Clowes. Size, 3½ by 5 in.; pages, 995. Cloth. Publishers, W. Thacker & Co., 2 Creed Lane, E. C., London, England. Price, 7s. 6d.

In this, the fourteenth annual edition of the Naval Pocketbook, there are no changes in the nature of the context, but in all parts the information has been carefully revised and brought up to date. The book gives as usual the statistics of the navies of the world, giving lists with brief specifications of all the warships in service or building for the different countries. Appended are profiles and deck plans of most of the important ships of the different nations. In addition to war vessels, the list includes ships controlled by the navy and military authorities covering those which in case of necessity might be pressed into service as transports or for other purposes in connection with military operations. Following the classified list of the navies are tables of the guns and small arms of the different nations and other general information and miscellaneous tables and records.

The Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, Pa., reports a very brisk trade in cold drawn seamless steel tubes of large diameters. The company has several Government orders for the Panama Canal among its contracts. It now draws seamless steel tubes as large as 4 in. in diameter and is preparing to produce them up to 6 in. in both tool steel and low carbon steel. The principal claims for Ivins tubes are extreme accuracy and smooth finish. Orders already entered will, it is said, run the works to full capacity for the next six months. The plant contains 42 draw benches and covers 2 acres of ground.

The Seneca Chain Company, Kent, Ohio, reports a decided improvement in the demand for chain and is now running its plant at full capacity. This company recently received an order from the United States Government for 61,000 ft. of ¼-in. square link chain for use on submarine boats.

PERSONAL.

Asa W. Whitney, whose resignation as secretary and metallurgist of the Sanford-Day Iron Works, Knoxville, Tenn., was announced in *The Iron Age* of May 13, has associated himself with the Enterprise Foundry & Machine Works, Bristol, Tenn.-Va., which has installed modern equipment for the manufacture of car wheels and mine cars.

J. C. Maloney has resigned as superintendent of the wire and nail departments of the rod and wire department of the Youngstown Sheet & Tube Company, Youngstown, Ohio, and has returned for a short period to his home at Swissvale, Pa.

Grant D. Bradshaw, formerly connected with the Gary Works of the Indiana Steel Company, has opened an office as consulting engineer at 77 Jackson boulevard, Chicago, and will make a specialty of blast furnace, rolling mill and general factory work.

Edwin S. Mills has been appointed special sales agent of the Carnegie Steel Company for the sale of railroad and other specialties of the company in the Chicago district, particularly steel car wheels, steel ties and sheet piling. He has opened an office in the Commercial National Bank Bldg., Chicago.

Frank G. Carpenter, whose articles on Oriental affairs have had wide circulation in the daily press, and who has recently returned to Washington from the Far East, is a brother of Reid Carpenter, secretary and treasurer of the Humphryes Mfg. Company, Mansfield, Ohio.

Thomas J. Rider, well known in New York for some years in connection with hot air engine trade, and who has been managing partner of J. B. Chapman & Co., Springfield, Mass., has succeeded to the business owing to the retirement of Mr. Chapman because of ill health.

George E. Slater, heretofore connected with the sales department of the Carnegie Steel Company at Pittsburgh, has been transferred to the St. Paul office of the company.

C. W. Brooks has opened an office for the Wisconsin Bridge & Iron Works, Milwaukee, in the New York Building, Seattle, Wash.

A. J. Reef has been placed in charge of designs and construction work, as engineer, by the Victor Fuel Company, Denver, Colo.

John Fraser has opened an office at 50 Church street, New York, as consulting engineer, making a specialty of designing manufacturing plants, heavy metal working machinery and hydraulic machinery.

Horace Hammond of the Hammond-Byrd Company, Birmingham, Ala., is again in his office after a month's absence, which was spent in the Northwest.

A large number of the officials of the Southern Iron & Steel Company participated in a banquet tendered them by the citizens of Gadsden, Ala., July 28th.

Ambrose Beard, now with the Follansbee Brothers Company, Pittsburgh, has been appointed assistant to Julian Burdick, secretary and treasurer of the West Penn Steel Company, Brackenridge, Pa., and will assume his duties September 1.

Niven McConnell, formerly with the Carnegie Steel Company at South Sharon, Pa., has been made general superintendent of all the works of the Standard Steel Car Company, Butler, Pa.

James A. Carr, of Richmond, Ind., has returned from a three months' business trip to Argentina, South America, whither he went in the interests of the American Seeding Machine Company. He says that American made machinery is used there almost altogether.

Dr. P. Heroult, who has been supervising the tests with his electric steel refining process at the South Works of the Illinois Steel Company, sails for Europe to-day, to be absent about two months. R. H. Wolff, of this city, who is Dr. Heroult's representative in this country, goes abroad next week.

Herman A. Prosser and Arthur L. Walker have formed a partnership under the name of Prosser & Walker, with offices at 42 Broadway, New York. They will conduct a general consulting metallurgical and engineering business.

The Buffalo Union Furnace Company.

The Buffalo Union Furnace Company, Buffalo, N. Y., last week elected the following officers: F. B. Baird, president; Harry Yates, first vice-president and treasurer; C. A. Collins, second vice-president; R. F. Schelling, secretary; M. McMurray, general manager; B. Marron, superintendent. M. A. Hanna & Co., Cleveland, Ohio, were appointed sole sales agents.

The largest stockholders of the company are Harry Yates and Frank B. Baird of Buffalo and the members of the firm of M. A. Hanna & Co., Cleveland, Ohio. The capacity of the plant at Buffalo has been recently increased to over 800 tons per day, and the Lake ore receipts by vessel this season will aggregate between 500,000 and 600,000 tons. It is quite probable that at a future date an additional furnace plant will be built by this company on the Niagara River, where M. A. Hanna & Co. recently purchased a large acreage of dock front.

The Pressed Steel Car Strike.—There is some prospect that the strike at the plant of the Pressed Steel Car Company at McKees Rocks, Pittsburgh, which has been in force for nearly three weeks, may be settled before this week is out. The company has made certain concessions to the men, including a reduction in the insurance rate, the investigation of charges of graft among officials and the suspension of all men in its employ charged with graft. The men further ask an increase in wages; that all strikers be taken back; time and half time for overtime, and double time for Sunday. The company has not yet given an answer to these demands.

The Westinghouse Machine Company, East Pittsburgh, has received orders for 1000 high power automobile engines, the first of the kind to be sold by this company, and negotiations are pending for upward of 50,000 more. The new business promises to make Pittsburgh a central point in the automobile industry of the country. For some time the company has been experimenting along advanced lines in automobile engine building, and as a result the first contract was closed for them last week. The building of turbine engines by the company has continued at a normal rate, and the new departure has increased the activity of the plant.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is this week operating its sheet mills to one-third capacity. It expects to increase to one-half capacity next week. The sheet mill strikers are quiet. The construction of the eight new sheet mills is proceeding steadily and they are to be ready for operation early next year. The company is making deliveries on its large contract to supply 8 in. pipe for an oil line in California.

The announcement is made that the hydraulic machinery divisions of two large German builders will be consolidated. The concerns in question are A. Borsig of Tegel, near Berlin, and Bechem & Keetman, of Duisburg. The new department is styled "Hydraulik" G. m. b. H. at Duisburg and will be under the management of the former head of the hydraulic department of Borsig, Wiland Astfalck.

The Atlanta Tin Plate & Sheet Mill, Atlanta, Ind., corrects the recent statement in these columns that its plant is run on the open shop basis. The management signed the Amalgamated scale for the twelve months beginning July 1.

The sale of the plant of the Tidewater Steel Company, at Chester, Pa., has been postponed to September 14.

OBITUARY.

CALVIN WELLS.

Calvin Wells, for many years prominent in the industrial life of Pittsburgh and chiefly known to the iron trade as president of the Pittsburgh Forge & Iron Company, died August 2 at his home in Pittsburgh, aged 82 years. He was born in Genesee County, New York, in 1827. At 14 he entered the general store of a brother-in-law at Detroit, and after two years went to Batavia, N. Y., where he was employed for three years also in a store. His connection with Pittsburgh began November 19, 1847, when he entered the Western University. He remained in school a year, afterward becoming bookkeeper in the wholesale drygoods house of Benjamin Glyde. In 1850 he formed the business connection which was to determine his main life work, entering the employ of Dr. Hussey, who was then engaged in the copper

CALVIN WELLS.

trade, having established a copper mill and warehouse at Pittsburgh. For two years Mr. Wells had a part in the management of the mill and warehouse. In 1852 the firm of Hussey & Wells was formed to engage in the bacon and pork business. This continued until 1858, when the firm of Hussey, Wells & Co., including Thomas M. Howe and James M. Cooper, was organized to manufacture iron and steel. Mr. Wells was made general manager, and for 17 years was largely responsible for the conduct of the business which was quite successful. In 1876 he sold his interest and severed his long connection with Dr. Hussey. He then engaged in the manufacture of railroad elliptic springs. In 1878 he was elected president and treasurer of the Pittsburgh Forge & Iron Company, offices which he held the remainder of his life. He also organized the Illinois Zinc Company, in which he had the chief interest for many years.

In 1877 Mr. Wells joined with others in the purchase of the Philadelphia *Press*, furnishing most of the capital. Under his ownership the property was developed and the paper made influential and profitable. Mr. Wells had other and varied interests, and was a director in a number of banks, as well as of the American Surety Company, New York. He was a member of important commercial organizations and was an executive committeeman of the American Protective Tariff League. In 1884 he headed the Republican electoral ticket of Pennsylvania as elector at large. Other political honors were tendered him but were declined.

Mr. Wells' business successes were attributable to a genius for hard work, an indomitable will and unusual ability in organization and execution. He did not hesitate to wrestle with the problems of enterprises which previously had met with little or no success. He leaves a son, Benjamin Wells, president of the Philadelphia *Press*, and two daughters. His wife died three years ago.

HUGO SACK.

Hugo Sack, a German designer and builder of rolling mill machinery, known to many American engineers, died June 23 at his shooting lodge at Offdilln. Born in 1860 at Loeben, the son of a maker of agricultural machinery, he studied engineering at Mittweida and Karlsruhe. After acquiring experience in various employments, he established the firm of Sack & Kiesselbach in 1891 and later the Maschinenfabrik Sack at Rath, near Düsseldorf, making a specialty of rolling mill machinery. In the middle of the eighties he became interested in the problem of rolling shapes in a universal mill and devoted much time and energy to its development, his efforts being crowned by the recent building at Rombach of the first of the mills of this type. He visited this country repeatedly in the interests of his invention.

THOMAS H. SEARS, president and treasurer of the Holyoke Steam Boiler Works, Holyoke, Mass., died July 30, aged 56 years. A native of Ireland, he came to this country as a boy, and at the age of 13 went to work at Hartford, Conn., as a rivet driver in a boiler shop. After experience in boiler works in various New England cities, he went to Holyoke in 1871 and entered the employ of Coughlin & Mullen, and became foreman, then superintendent and finally manager, which position he held in 1902, when the business was incorporated as the Holyoke Steam Boiler Works. He was a member of the Holyoke and Pequot clubs. He leaves a widow and five children.

DAVID H. GILDERSLEEVE, mechanical engineer, died July 30 in Brooklyn, N. Y. He was graduated from Stevens Institute in 1889 and served as First Lieutenant in the United States Corps of Engineers in Cuba during and after the Spanish-American war. He was assistant engineer of the Department of Havana and had entire charge of the mechanical work there. For five years he was sales manager for the C. W. Hunt Company, maker of conveying machinery, but recently he became vice-president of the Waters, Gildersleeve, Colver Company, in the shipbuilding and marine machinery business. He leaves a widow and two children.

The Coal and Iron National Bank, Liberty and West Streets, New York, was admitted to full membership in the New York Clearing House Association, July 26. In view of the fact that during the past year the requirements of the association have been unusually high, it has been difficult for new institutions to obtain admission except as an associate member. This is therefore an important matter to a New York bank and indicates an exceptionally strong and unusually high class business. It had been an associate member for four years. It commenced business April 11, 1904, with a capital of $300,000, surplus $180,000. Its capital is now $1,000,000, with surplus and profits $300,000, all of which has been earned and is part of the capital. The deposits are now in excess of $6,000,000. A large representation of coal, railroad and manufacturing interests is on the Board of Directors and the *clientele* extends very largely through the coal, iron and machinery trades.

Contracts placed for machinery required for the equipment of the new addition to the sheet mill of the Inland Steel Company, at Indiana Harbor, Ind., include a 34 and 60 x 60 in. cross compound condensing engine built by the Mesta Machine Company, eight finishing mills with roughing rolls, four cold rolls and a heavy grate shear furnished by the United Engineering & Foundry Company, and one 35, one 25 and two 5 ton Alliance electric traveling cranes. The mill structure will be erected by the Morava Construction Company.

Pig Iron Production.

A Great Gain by Steel Works.

Their Output in July Close to the Record of October, 1907.

Pig iron production made another forward leap in July, the increase being all contributed by the steel works furnaces. The total of coke and anthracite pig iron for the month was 2,101,579 tons, against 1,930,866 tons in June. The steel company blast furnaces, of which there were 13 more in blast August 1 than July 1, produced 1,508,762 tons last month, or within a few thousand tons of the record of 1,514,521 tons made in October, 1907. These figures take no account of the foundry iron produced by a few steel company stacks. The capacity of all coke and anthracite furnaces in blast August 1 was 488,742 tons a week, against 463,029 tons a week July 1. Thus we are now producing at the rate of about 25,500,000 tons a year, allowing for the production of charcoal iron, which is not included in our statistics. The United States Steel Corporation had 11 more furnaces at work on the production of steel making pig iron on August 1 than on July 1.

July Product by Districts.

The table below gives the production of coke and anthracite furnaces in July and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York....	117,219	91,283	112,669	123,792	152,249
New Jersey...	19,577	19,798	19,836	18,590	19,002
Lehigh Valley.	49,072	46,463	58,176	52,464	55,294
Schuylkill Val.	58,169	54,004	52,755	46,004	47,323
Lower Susquehanna and Lebanon Val.	45,150	45,973	52,687	52,361	50,738
Pittsburgh Dis.	407,148	403,981	446,656	479,362	523,703
Shenango Val.	85,321	77,434	103,783	110,004	124,436
West. Penn...	139,873	129,543	128,413	112,975	119,904
Md., Va. and Kentucky ...	56,402	63,311	60,143	54,448	52,551
Wheeling Dis.	58,156	46,696	63,980	94,664	111,620
Mahoning Val.	160,357	171,107	171,811	175,949	196,593
Central and North. Ohio.	126,719	119,226	125,554	135,319	148,969
Hocking Valley, Hanging Rock and S. W. Ohio	48,521	43,841	38,995	32,908	26,872
Mich.,Minn.,Mo., Wis., Colo...	72,481	55,995	58,045	59,187	56,722
Chicago Dis..	219,009	211,776	250,363	263,126	287,106
Alabama	143,407	136,909	119,823	101,280	108,482
Tennessee, Georgia and Texas	29,613	21,537	19,641	18,433	20,015
Totals....	1,836,194	1,738,877	1,883,330	1,930,866	2,101,579

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese (as well as ferrosilicon), which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1907.	1908.	1909.	1908.	1909.
January	1,406,397	664,415	1,117,823	20,254	12,325
February	1,317,923	745,802	1,073,363	9,402	10,046
March	1,424,827	841,502	1,140,553	13,750	23,743
April	1,446,788	725,548	1,093,092	12,363	22,478
May	1,470,080	759,674	1,256,448	17,823	20,834
June	1,457,230	717,689	1,365,527	15,958	16,516
July	1,452,557	798,639	1,508,762	10,250	17,613
August	1,445,685	897,052	.....	14,932	....
September	1,417,153	933,514	.....	8,938	....
October	1,514,521	996,481	.....	12,174	....
November	1,084,114	981,167	.....	15,882	....
December	659,459	1,090,339	.....	6,510	....

The number of active furnaces of the United States Steel Corporation and of the independent steel companies at the beginning of each month since January appears below:

	Steel Corporation.	Independent steel companies.
Furnaces in blast February 1.....	62	49
Furnaces in blast March 1.....	65	45
Furnaces in blast April 1.....	66	39
Furnaces in blast May 1.....	68	42
Furnaces in blast June 1.....	77	48
Furnaces in blast July 1.....	82	50
Furnaces in blast August 1.....	93	52

The Steel Corporation's foundry iron furnaces at Bessemer, Ala., and Bay View, Wis., are not included in the above figures, nor are the furnaces of the Lackawanna Steel Company, in the Lebanon Valley, and of the Republic Iron & Steel Company in Alabama, which produce foundry iron.

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with July, 1908, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
July, 1908	25,762	13,525	39,287
August	28,952	14,899	43,851
September	31,117	16,183	47,300
October	32,217	18,337	50,554
November	32,705	19,890	52,595
December	35,172	20,986	56,158
January, 1909	35,983	21,992	57,975
February	38,367	22,609	60,976
March	36,811	22,421	59,232
April	36,436	21,526	57,962
May	40,531	20,222	60,753
June	45,507	19,149	64,656
July	48,670	19,123	67,793

Capacity in Blast August 1 and July 1.

The following table shows the weekly capacity of furnaces in blast August 1 and July 1, the furnaces blown in in July being rated on the records of previous performance:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	August 1. Number in blast.	August 1. Capacity per week.	July 1. Number in blast.	July 1. Capacity per week.
New York:					
Buffalo	16	15	33,516	12	27,159
Other New York.	7	3	3,720	3	3,225
New Jersey.....	8	4	4,750	3	4,338
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley...	25	13	11,834	12	11,331
Spiegel	3	1	140	1	140
Schuylkill Valley	15	8	11,164	7	10,734
Low. Susquehanna	7	4	6,628	5	7,492
Spiegel	1	1	610	1	602
Lebanon Valley..	10	5	5,290	3	3,910
Pittsburgh Dist..	48	44	120,008	42	112,685
Spiegel	2	2	1,862	2	1,692
Shenango Valley.	20	17	30,025	14	28,507
W. Pennsylvania.	27	16	27,076	16	27,792
Maryland	4	2	4,466	2	4,560
Wheeling District..	14	11	25,970	10	24,654
Ohio:					
Mahoning Valley.	20	17	44,394	17	43,854
Central and North and Michigan.	22	16	36,767	13	32,888
Hocking Valley, Hang. Rock and S. W. Ohio....	15	8	6,314	7	5,812
Illinois and Indiana	28	23	61,418	23	62,209
Spiegel	2	1	1,395	1	1,052
Minnesota and Wis.	7	4	4,208	5	5,393
Missouri & Colorado	7	4	7,167	4	7,308
The South:					
Virginia	23	10	6,974	9	6,683
Kentucky	5	1	650	2	1,461
Alabama	46	21	27,706	17	23,150
Tennessee	18	8	4,690	8	4,398
Georgia & Texas.	3	0	0	0	0
Totals.....	405	259	488,742	239	463,029

The list of furnaces blown in in July includes the Detroit Furnace Company's stack at Detroit, one Buffalo Union, one Lackawanna and New York State Steel Company (new) at Buffalo, one Brooke in the Schuylkill Valley, one Hokendauqua in the Lehigh Valley, one Carrie and one Isabella in the Pittsburgh District; Ella, Sharon and one South Sharon in the Shenango Valley (Sharpsville, in July 1, being reported last month), one Colebrook and Lebanon Valley in the Lebanon Valley, Alleghany in Virginia, one Bellaire in the Wheeling District, Emma and one Lorain in northern Ohio, Sarah in the Hanging Rock District, one South Chicago in Illinois, and one Clifton, Central, Woodstock, Alice and two Ensley in Alabama. Among furnaces blown out or banked for repairs were one Paxton in the Susquehanna Valley, Watts in Kentucky, one Calumet in Illinois, one Mayville in Wisconsin, Rockdale in Tennessee and one Pioneer and one Bessemer in Alabama. The net gain in active furnaces in July was 20.

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1907, the figures representing gross tons:

	Capacity per week.		Capacity per week.
August 1, 1909.....	488,742	April 1.....	264,890
July 1.....	463,029	March 1.....	267,437
June 1.....	446,096	February 1.....	241,925
May 1.....	412,010	January 1, 1908....	235,152
April 1.....	409,217	December 1, 1907....	347,372
March 1.....	420,807	November 1.....	491,436
February 1.....	414,497	October 1.....	511,397
January 1, 1909....	401,994	September 1.....	507,768
December 1, 1908...	381,102	August 1.....	513,471
November 1.....	362,685	July 1.....	528,170
October 1.....	337,925	June 1.....	523,220
September 1.....	313,112	May 1.....	524,538
August 1.....	284,590	April 1.....	496,456
July 1.....	264,452	March 1.....	511,035
June 1.....	259,284	February 1.....	492,359
May 1.....	268,674	January 1, 1907....	507,397

The Cost of Making Copper.

The Boston *News Bureau* prints the following: "What is the average cost of 'making' copper in this country?" is a question not infrequently propounded. We have endeavored to answer it, and submit the results of our analysis herewith:

We have included in our calculations the production of Canada and Mexico, so that the final results are those of the North American continent. To summarize, we find that, excluding items of construction (beyond ordinary replacements which are generally treated as an operating item) and depreciation and taking no account of some charge which should properly be made against exhaustion of ore, the average cost of making copper is a fraction over 10 cents per pound. Were construction and improvement work treated as an operating charge, the average would be brought up to at least 10½ cents.

There are varying degrees of liberality employed by the copper producers in the treatment of the operating account. It cannot be denied that in very many instances charges are made to capital which justly belong in the expense account, in order that the apparent "operating surplus" may be benefited. Few companies, for instance, can compare with Calumet & Hecla in the conservatism of its bookkeeping. It makes no difference for what purpose the funds of this company are expended, they are chalked up against the cost of doing business.

The copper mines of America are outputting at the rate of somewhat over 1,300,000,000 lb. of the red metal per annum. The current expense of recovering this product is $138,057,000, an enormous sum, and of which probably 65 per cent. represents the cost of labor. We may subdivide this huge copper total with respective costs as follows:

Output—Pounds.	Average cost per pound. Cents.	Total costs.	Per cent. of total.
483,000,000	8½	$41,050,000	35.6
168,000,000	10	16,800,000	12.4
525,000,000	10¾	56,437,000	38.6
191,000,000	12½	23,770,000	13.4
Average	10	*$138,057,000	*100.0

* Total.

Taking a closer view of the preceding table, which condenses a vast amount of statistics, it will be seen that but 35.6 per cent. of this country's output may be classified as low cost copper. In this group we have included all companies making copper for 9 cents and under. Lake Superior, with the premier Calumet & Hecla, contributes 141,000,000 lb. of this 483,000,000-lb. total, or about 30 per cent. The Copper Queen of Arizona furnishes 100,000,000 lb. of 9-cent copper and the Utah Copper Company furnishes 60,000,000 lb. The balance of the "honor class" is made up of North Butte, Mammoth, Calumet and Arizona, the Ely mines and a number of smaller producers.

The next group, comprising 168,000,000 lb. of output, or 12.4 per cent. of the total, includes copper made at over 9 cents and not more than 10, the most conspicuous member of this class being Boston & Montana with 90,000,000 lb. of 9½-cent copper.

The largest division, embracing 525,000,000 lb., or 38.6 per cent. of the total, covers copper made for 10 cents and not over 11, and in this category are such properties as Anaconda, Butte Coalition, Osceola, Quincy, Mohawk, Boston Consolidated, Greene Cananea, Granby, Old Dominion, Detroit, Arizona Copper and others.

The last division is made up of miscellaneous production in all sections of the country. It embraces copper made at a cost of over 11 cents and there is here included a vast amount of metal which is produced at an absolute loss. This product constitutes almost 15 per cent. of the total, and in some respects is the real menace to the copper market. It makes little or no money for its owners and is throwing itself upon a market which is to-day burdened with just about this amount of excess production, and to that extent deprives the other 85 per cent. of lower-cost output of a higher selling price. But, of course, there will always be high cost copper to contend with. Some of it represents copper taken out in the course of development and exploration, while a portion could be withheld were it not for the timidity of the managements who shrink from the criticisms of stockholders eagerly clamorous for a large output, whether or not it can be sold for a fair profit.

Of the major copper producing districts Lake Superior is still the lowest cost copper camp in this country, and its rock or ore is of the lowest grade. The average yield from Michigan rock is not over 25 lb. of copper per ton, and it must stamp almost 10,000,000 tons of rock annually to recover 237,000,000 lb. of copper—its present yield.

The importance of the 8-cent producers of Ely and the prospective low-cost producers of the Globe and Kelvin camps is quickly appreciated when it is realized that 52 per cent. of this country's copper is made at a cost of over 10½ cents per pound.

NEWS OF THE WORKS.

Iron and Steel.

Wm. Swindell & Brothers, engineers and contractors, German National Bank Building, Pittsburgh, recently closed contracts with the Fort Pitt Malleable Iron Company, Pittsburgh, for the erection of three open hearth steel melting furnaces and ten Swindell annealing furnaces; Firth-Stirling Steel Company, Washington, D. C., one soaking pit and one crucible steel melting furnace; A. M. Byers & Co., one regenerative socket furnace; Superior Steel Company, Carnegie, Pa., two large gas fired annealing furnaces; Singer Mfg. Company, Elizabethport, N. J., two heating furnaces. They have recently completed the entire furnace equipment, consisting of heating and annealing furnaces, for the new Ohio Seamless Tube Company, Shelby, Ohio, and have also received a number of orders for Swindell reversing valves.

The new open hearth steel plant and sheet mills of the West Penn Steel Company at Brackenridge, Pa., are rapidly nearing completion, and it is expected that operations will be commenced about October 15.

Alice Furnace of the Tennessee Coal, Iron & Railroad Company, at Birmingham, Ala., as well as two furnaces at the Ensley, Ala., plant are being operated on foundry iron. The stacks when last in operation were producing basic metal.

The Wilkes Rolling Mill Company, Sharon, Pa., manufacturer of muck bar, bar iron and iron and steel sheets, is adding a department for the manufacture of a new product, which the company styles iron tin plate. Reports that the company would discontinue making iron sheets are incorrect, as it will still make this product.

The Salem Iron Company, Leetonia, Ohio, advises us that reports that its blast furnace will be started at an early date are untrue. No date has been set yet for the starting of the stack. Some improvements are being made to this furnace, including relining and a gas washer.

Sarah Furnace of the Kelly Nail & Iron Company, Ironton, Ohio, was blown in July 9.

Ella Furnace of Pickands, Mather & Co., at West Middlesex, Pa., which was blown in August 1, has been rebuilt and is now 15½ x 70 ft.

Geo. J. Hagan, engineer and contractor for furnaces and gas producers, has established offices at 401 People's Bank Building, Pittsburgh. Recent contracts secured and on which work is progressing are the following: Huron Steel & Iron Company, Norwalk, Ohio, 20-ton open hearth furnace; Sligo Iron & Steel Company, Connellsville, Pa., two faggot heating furnaces and bricking in two 250-hp. Wickes water tube boilers; Thomas Steel Company, Niles, Ohio, two gas producers, sheet and pair furnaces and annealing furnaces.

The Fort Pitt Spring & Mfg. Company, manufacturer of coil and elliptic springs, vanadium steel springs, &c., Pittsburgh, Pa., with plant at McKees Rocks, Pa., reports considerable activity in the spring business and that orders on its books are very satisfactory. It expects to place its works on double turn about August 15, for railroad and other work, which will allow continuous operations for six months ahead. The company has recently moved its general offices from the seventh floor to 2414-15 Farmers' Bank Building, Pittsburgh.

General Machinery.

A new shop for general job work is being installed at Quanah, Texas, by the Quanah Machine & Foundry Works, Kahlert & Holman, proprietors.

Machinery such as is used for the manufacture of automobile wheels and hubs is being purchased by the Weston-Mott Company, Flint, Mich., for equipping the addition to its plant. The new building will be two stories and basement, 75 x 400 ft.

The Harley-Davidson Motor Company, Milwaukee, Wis., will have bids taken by the Hirschberg-Williams-Washburn Company,

construction engineer, for new building and equipment, including boiler house.

The Detroit Pneumatic Tool Company, Detroit, Mich., has been compelled by the enlargement of its business to add to its machinery equipment for the manufacture of pneumatic riveters, hammers and air hoists.

The Jones & Laughlin Steel Company, Pittsburgh, is now receiving from Mackintosh, Hemphill & Co. a very large blooming engine ordered for its new steel plant at Aliquippa, Pa. The engine is practically an exact duplicate of one furnished several years ago to the Duquesne Steel Works of the Carnegie Steel Company by Mackintosh, Hemphill & Co. It is of the twin tandem compound condensing direct connected reversing type. The cylinder dimensions are 44 and 70 in. and the stroke 60 in. At 100 rev. per min. the engine will develop 20,000 hp.

A crushing plant of large capacity will be erected at the Corona, Cal., quarry of the Fairchild-Gilmore-Wilton Company.

The National Iron Works Company has secured a site on Ashbridge Bay, Toronto, Canada, upon which it intends to build a plant to cost about $100,000.

Centrifugal pumps of 1,500,000 gal. daily capacity will be purchased by the Northern Pacific Railroad for a water supply station at Dickinson, N. D.

A pumping plant for water system will be built by the city of Belden, Neb.

The Louisville Cement Company, Louisville, Ky., will install new elevating machinery.

The Delaware, Lackawanna & Western Railroad has awarded general contract to F. D. Hyde, 90 West street, New York, for the construction of a one-story 84 x 480 ft. brick, steel and concrete car repair shop at East Buffalo, N. Y.

Willard H. Read, 396 Third avenue, Troy, N. Y., is about to start construction on a one-story concrete machine shop building to be erected in Upper Troy.

Foundries.

The Brazil Machine & Foundry Company, Brazil, Ind., successor to the Adrian Brick & Tile Machine Company, Adrian, Mich., expects to begin the erection of a new foundry 50 x 100 ft. in the near future. Equipment for this plant will be moved from the old factory at Adrian, Mich.

A. G. Eberly, J. Howard Swartz, James P. Shaw, A. S. Jacobson and others of Mechanicsburg, Pa., who recently purchased the plant of the Yost Vise Company, which has been remodeled for making iron castings, will begin operations as soon as they have received a charter for the company which is to operate the plant, which will be probably in a week or two. A machinery department will be added to the plant later.

The W. K. Henderson Iron Works & Supply Company, Shreveport, La., intends to install a number of molding machines and air hoists in its new foundry, 80 x 151 ft. Some of these machines have been purchased.

Power Plant Equipment.

Having purchased extensive water rights on North Battle Creek in Shasta County, Cal., the Sacramento Valley Power Company, Redding, Cal., will develop the water power to the extent of more than doubling the present capacity of its plant.

Electrical apparatus for a new substation is to be purchased by the Ashland Light & Power Company, Ashland, Wis.

Enlargement of its water power and the installation of a generator to supply current for electric drive is contemplated by the Montello Granite Company, Montello, Wis.

The City Clerk of Monett, Mo., will receive bids until September 1 for the installation of an electric light plant, the equipment to include a Corliss engine direct connected to alternating current generator, high speed automatic engine direct connected to alternating current generator, exciter, controlling apparatus, switchboard, three tubular boilers, stand pipe, feed pump, feed water heater and other accessories.

The Parker Boiler Company, Philadelphia, Pa., has received an order from the King Phillip Copper Company, Winona, Mich., for three 267-hp. boilers, and from the Winona Copper Company, Winona, Mich., for one 300-hp. boiler. This is the second order from the former company and the third from the latter.

A new power plant of 300 hp. is being planned by the Nevada Wonder Mine, Wonder, Nev.

Considerable new electrical machinery will be purchased this fall by the Omaha (Neb.) Electric Light & Power Company.

Muralt & Co., engineers, New York, have been awarded contract for the electrical equipment of the new municipal lighting and pumping plant at Berlin, Md. The alternators will be of the belted type and will be driven by gas engines supplied by producer gas.

An electric lighting plant will be installed by the Jumbo Plaster Company, Richfield, Utah, to enable it to operate night shifts.

The Shuttleworth Brothers Company, Amsterdam, N. Y., is having plans prepared and will be ready for figures next week for a steel and concrete fireproof factory building, six stories, 65 x 205 ft., to be erected on Sweeney street. The power equipment to be installed in the main building will consist of four horizontal tubular boilers, two Corliss engines and a line of special machinery for the manufacture of carpets and rugs.

The Valley Power Company's generating equipment will be doubled in capacity at Peshastin, Wash.

S. F. Gilman, Pierce, Neb., will be in the market this fall for a Corliss engine and electric generator.

The American Plate Glass Company at Kane, Pa., is installing a 700-hp. Westinghouse horizontal gas engine for power purposes, and has also just contracted for a 16-in. by 26-in. twin tandem horizontal Westinghouse engine to be direct connected to a 400-kw. generator.

The Minneapolis Steel & Machinery Company has taken contract for two gas engines and producers, aggregating 250 hp., which will drive electric generators in the power station of the Huron (S. D.) Light & Power Company.

Bridges and Buildings.

The Cleveland-Cliffs Iron Company has let contract to A. F. Wagner, Milwaukee, for structural iron to be used in building operations at Gwinn, Mich.

The Hackendahl & Schmidt Company, Milwaukee, has taken contract for the iron work of Kearney & Trecker's new power house at West Allis, Wis.

William G. Gregg, Newburgh, N. Y., representing the New Amsterdam National Bank, has purchased the structural iron plant on the Hudson River at New Windsor, on the outskirts of Newburgh. No definite plans have been formulated for operating the plant.

The Sterling Engineering & Construction Company has decided upon the erection at Milwaukee, Wis., of a four-story light manufacturing building in which its own quarters will be established.

The Eau Claire, Wis., Board of Public Works is taking bids on a new steel bridge across the Chippewa River. The contract will be awarded August 15.

The authorities at Sparta, Wis., have engaged the Illinois Bridge Company to construct two steel bridges there.

The Reliance Motor Truck Company, A. M. Bently, president, Owosso, Mich., is having plans prepared for an additional factory building.

Fires.

The main building of the Hayes Run Fire Brick Company's plant, at Hayes Run, near Lock Haven, Pa., was destroyed by fire July 30, the loss being about $50,000.

The plant of the Niagara Pulp Company, at Niagara Falls, N. Y., was damaged $30,000 by fire July 31.

The foundry of the Domestic Engine & Pump Company, Shippensburg, Pa., was damaged $5000 by fire July 24.

Hardware.

Arrangements are being made for the incorporation of a manufacturing enterprise at Spokane, Wash., to be known as McCabe & Co., to build fanning mills. The machines are now being made in outside shops, but the company expects to operate its own factory within a short time.

A new factory is being erected at Bay City, Mich., for the Bay City Swing & Ladder Company. The building is of cement and brick construction, 48 x 160 ft.

The Union Steel Screen Company, Ltd., Albion, Mich., has contracted with the Perry Tire Protector Company, Lansing, Mich., to manufacture automobile tire chains, which constitute the product of the latter concern. The Perry Tire Protector Company will move its offices from Lansing to Albion, Mich.

The Asbestos Protected Metal Company has just completed plans for an addition to its manufacturing plant at Canton, Mass., and also for the extension of its office building at the same place.

Miscellaneous.

The town of Shirley, Ind., will build a water works system at an estimated cost of about $25,000, which will include a pumping station, 26 x 64 ft., of brick and cement construction, machinery equipment, pipe, &c. Bids for the work will be received until August 23. B. L. Byrket is president of the Board of Public Works, and George C. N. Wallace, 420-426 Eighth street, Anderson, Ind., is engineer in charge.

The citizens of Central City, Neb., have approved by vote the issue of bonds for the installation of an electric light plant. It is expected that this improvement will be made without delay.

Another instance of the remarkable expansion of the automobile industry is the recent addition of 50,000 sq. ft. of floor space to the fireproof factory buildings of the Streator Motor Car Company, Streator, Ill. The works will have a capacity for turning out 2000 cars next season, and sales contracts already closed cover over one-half of this number.

The G. B. Lewis Company, Watertown, Wis., is preparing to rebuild its beeware factory recently destroyed by fire upon a new site with convenient shipping facilities. The plant will

consist of a one-story main building, 80 x 209 ft., of brick and concrete construction with steel roof. There will also be a warehouse, 80 x 200 ft. Power for the operation of the plant will be supplied either by electric current from the local plant or by a producer gas unit, the installation of which is under consideration. Some of the machinery that went through the fire is being repaired for use in the new plant, but the company is in the market for a dove-tailing machine, band re-saw and some small saw tables

The town of Center, Texas, has by a majority vote authorized a bond issue of $20,000 for the purpose of extending the water works system.

Bonds to the amount of $35,000 have been voted by the city of Seymour, Texas, to provide funds for the installation of municipal water works and sewerage systems.

Plans are being prepared by Arnold C. Koenig, Omaha, Neb., for a water works system to be installed at Belden, Neb.

The Mayor of Perry, Ga., will receive bids until August 18 for the construction of a water supply system.

The Fiat Automobile Company, New York, which is to construct a large plant at Poughkeepsie, N. Y., has been incorporated with a capital stock of $2,000,000.

The Board of Trustees of Public Affairs, Bradford, Ohio, will receive bids until August 16 for pumps, engines, stand pipe and other material for the construction of a water works system.

The International Acheson Graphite Company is enlarging the capacity of its branch works in Niagara Falls, Ont. This company has for many years operated a Canadian branch with facilities far in excess of the demands of the Canadian trade. It, however, recognizes in the hydroelectric development now so active throughout the Dominion and the new trade spirit and energy everywhere present throughout Canada an indication of additional industrial enterprise, and it is to meet the prospective demand for its product likely to be created by the new conditions that it is increasing the size and capacity of its plant in Niagara Falls, Ont. A new furnace room providing for a 1000-hp. unit is being built, and on completion the new furnace installation will be placed in operation. All Acheson-Graphite is made in the electric furnace, and the business of the company stretches out into every country on the globe.

The National Anti-Friction Roller Bearing Company has been incorporated at Buffalo, N. Y., with a capitalization of $250,000, and is arranging for a manufacturing plant in that city. The directors are Albert T. Killian, Jareslaw de Zielinski and Frederick D. Tracy, 76 Johnson's Park, Buffalo.

Reeves & Co., manufacturers of threshers and farm machinery, Columbus, Ind., will build a branch factory at Regina, Canada, for the manufacture of steam gang plows, which are drawn by traction engines. William F. Schowe will superintend the erection of the plant.

Jacob Johannes, carriage manufacturer, St. Paul, Ind., has decided to build automobiles, and will make the necessary alterations and additions to his plant.

The Riverside Metal Refining Company, Connellsville, Pa., manufacturer of Babbitt metal and brass for bearings, &c., and which has been established in Connellsville for about 25 years, has recently made some changes in management, A. B. Norton, Jr., succeeding his brother, Charles Norton, as manager. This company is working full time and has recently received an order for 50 tons of special ingot brass. It has lately added a new brand of Babbitt metal to its line, known as United States Standard brand, which is especially adapted for use in iron and steel works on heavy rolls and bearings.

A water works system, including pumping plant and 75,000-gal. steel tank, has been decided upon by Bowman, N. D.

Plans are being drawn for a new factory which the Gary Motor Car Company purposes to build at Muskegon, Mich., with the assistance of the local Chamber of Commerce, which has been striving to have it locate there.

The Carborundum Company, Niagara Falls, N. Y., has awarded contract to the Turner Construction Company, New York and Buffalo, for the construction of an additional steel and concrete building, four stories, 64 x 240 ft., to be devoted to the manufacture of a special line of abrasive materials.

Customs Decisions.

Automobile Tire Bolts.

The Board of United States General Appraisers has decided that so-called security bolts, designed to hold automobile tires in place, are dutiable properly at the rate of 45 per cent. under the general provision in the tariff act for "manufactures of metal." Charles Dien, whose importations were under consideration, objected to Collector Loeb's classification of 45 per cent. and appealed to the board, making the contention that the articles should be classified under paragraph 145. This provision specifies that bolts of various kinds shall pay duty at the rate of 1½ cents per pound. Mr. Dien claimed that the articles are undoubtedly "bolts," and should be allowed to enter this country accordingly.

General Appraiser Fischer, who writes the decision for the board, takes a contrary view, and, on the record before him, holds the goods properly assessed. It was shown at the trial of the case that the bolt proper is of steel or iron and has a flange shaped head covered with leather and cotton duck. The exposed part is coated with nickel. The bolt is supplied with a leather washer, a metal washer and a thumb nut or screw. These latter metal parts are composed of brass coated with nickel. In overruling the claim the general appraiser says, in part: "Though the bolt proper may possibly be within the provision for 'bolts of iron or steel,' we are of the opinion that the brass washers and nuts cannot fairly be included within the provisions of paragraph 145. There has been no attempt made to separate these articles, nor are we aware of the values for the brass parts as distinguished from the iron or steel bolt. On the record before us we must overrule the protests. The decision of the collector will stand."

Built-Up Mica.

The board has taken unfavorable action on a protest filed by F. W. Myers & Co. regarding the classification of so-called built-up mica. It was held by the importers of the article that the product should be granted entry either as an undecorated mineral substance or else as an unenumerated manufactured article. The collector took the position that the merchandise should be classified as mica, cut or trimmed, with duty at the rate of 12 cents per pound and 20 per cent. ad valorem. This classification, General Appraiser Fischer in his decision for the board sustains, thereby overruling the importer's claim. The mica plate is made by building up a number of smaller sheets or pieces of mica which fall off in the process of rough trimming, the pieces being made to adhere by means of alcohol and gum shellac spread between the various layers.

Steel Drawplates and Wortles.

The Newman-Andrew Company, New York, has received a favorable decision from the board regarding the classification of steel drawplates and wortles. It was the contention of the classifying officers that the articles should be regarded as "manufactures of metal," with a duty of 45 per cent. This view, however, the board, in its decision written by General Appraiser Fischer, is unable to take. The General Appraiser finds that the drawplates are generally known in trade as wire drawing plates and should therefore be allowed to enter as "plates not specially provided for," with duty at the rates prescribed in paragraph 135 of the tariff act. Relative to the wortles, the board find that they should be allowed to enter as "forgings," under the provisions of paragraph 137. He denies the Government's claim that the drawplates are highly finished articles. The decision says that the drawplates, on the contrary, are roughly finished, and, as imported, must be further manipulated. Consequently, they cannot be regarded as "manufactures." The Government's assessment of 45 per cent. on both classes of articles is set aside and the lower rates granted.

Sundry Decisions.

The reappraisement division of the board has decided that the appraiser at New York was correct in advancing the value of cartridges sent to this country by Moritz Magnus, Jr., of Hamburg. The assessment of the higher duty stands.

The board has overruled claims filed by Austin Baldwin & Co., F. B. Vandegrift & Co., H. & A. Allen and others, regarding the duty on iron sand.

The Robert Roseman Company succeeded in securing lower duty on iron castings, while goods of the same character imported by H. G. McKerrow, Ltd., Boston, were held dutiable. It appeared that there was nothing in the record in the latter case to warrant disturbing the collector's decision.

Other decisions affecting the metal industry and sustaining the importers' contentions have been handed down, as follows: E. Denike, zinc ore; Samstag & Hilder Brothers, needles, and Butler Brothers, metal articles.

The Iron and Metal Trades

Pig Iron Production Increasing Very Rapidly.

Expansion Due to Steel Works Furnaces.

In response to greatly improved conditions, the pig iron production of the country is rapidly expanding, the increase, however, being all contributed by the steel works companies. The total output of anthracite and coke pig iron for July was 2,101,579 tons against 1,930,866 tons in June. Of the former figure the steel works furnaces made 1,508,762 tons, or within a few thousand tons of the record of 1,514,521 tons made in October, 1907. The United States Steel Corporation did, last month, break its best record with a total production of pig iron of 1,030,661 tons as compared with 1,008,421 tons in October, 1907. Including charcoal iron, we are now running at the rate of 25,500,000 tons per annum, a marvelously rapid recovery.

The tone of the market is very cheerful throughout. Sellers are acting more and more cautiously and buyers are abandoning reserve, even in those instances where their own business has not actually improved materially.

Interest is developing in orders for delivery during 1910, but transactions are as yet isolated because of the attitude of sellers who either refuse to commit themselves or name figures which they do not expect to be considered.

In eastern Pennsylvania further purchases of basic pig iron have been made, the total figuring up to close to 60,000 tons, of which the larger part is for delivery next year at $17, delivered. Some of these inquiries went to Western furnaces, which, however, could not handle them to meet the parity. It is not probable that the Steel Corporation will purchase any considerable quantity of pig iron for some time.

In the West the most significant transaction has been the first sale for delivery during the first half of 1910, being a lot of 6000 tons of Northern No. 2 foundry iron at $17.50, Milwaukee. In the St. Louis District a round block of basic pig has been placed, and 6000 tons of car wheel iron has been purchased.

The steel market is active in all sections, although, of course, the tonnages involved are small when compared with the olden days. Chicago reports a sale of 10,000 tons of axle billets for early delivery.

Aside from an addition of 5000 tons to the Harriman order, no transactions of any consequence in rails are reported. Some good lots are in the market, however. Both the Baltimore & Ohio and the Pennsylvania are in the market for additional quantities and there is an inquiry for 20,000 tons for the Burlington.

The Carnegie Steel Company has advanced its price on plates and shapes to 1.40c., Pittsburgh. Orders and inquiries for cars are coming in in good volume, among them being 8000 cars for the Pennsylvania lines, which will also build 900 cars at its Altoona shops. There has also been placed 2000 tons of material for a Lake passenger boat. The largest orders for structural material reported are: 13,500 tons for the Winner bridge at Kansas City, and 5000 tons for the by-product coke oven plant at Gary. The Pullman Company is in the market for 7000 tons for new freight car shops and 6500 tons is required for the new Sherman House at Chicago.

The minimum price for steel bars is now 1.30c., Pittsburgh. Specifications are pouring in. The Illinois Steel Company received a total of 50,000 tons in July.

There were rumors of a contemplated advance in merchant pipe but the feeling is that present prices are fair to all concerned.

Export trade is moving along quietly, and in the usual volume, without any special transactions of interest. An American mill has taken an order for 3500 tons for a Canadian pipe line.

Some interesting movements are taking place in the international rail markets. English makers have retaliated on the Canadian who had invaded their territory by capturing business recently in Quebec and British Columbia. There was sharp competition lately among American mills for the Manila order of 10,000 tons. The Queensland government roads have purchased 9000 tons from the United States Steel Corporation.

Fear of prospective competition has caused the association of English sheet makers to drop the price from £12 10s. to £10 10s., and the international markets are somewhat demoralized.

All the leading open hearth steel makers of the East appear to have reached an arrangement by which a firm of merchants will act as their agent in the purchase of melting scrap. The majority of these steel works have at different times acted in concert in the scrap market.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 4, 1909.	July 28, 1909.	July 7, 1909.	Aug. 5, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	**$16.75**	$16.75	$16.50	$16.50
Foundry No. 2, Southern, Cincinnati	**16.25**	15.75	15.75	15.00
Foundry No. 2, local, Chicago	17.00	17.00	17.00	17.35
Basic, delivered, eastern Pa.	**16.50**	16.50	15.50	15.00
Basic, Valley furnace	**15.25**	15.25	15.00	15.00
Bessemer, Pittsburgh	**16.90**	16.90	16.15	16.40
Gray forge, Pittsburgh	**14.90**	14.90	14.65	14.90
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.59
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	**24.00**	24.00	23.00	25.00
Forging billets, Pittsburgh	**28.00**	28.00	27.00	27.00
Open hearth billets, Philadelphia	**27.00**	25.50	25.00	26.20
Wire rods, Pittsburgh	**31.00**	31.00	29.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**15.25**	14.75	14.50	13.50
Steel rails, melting, Philadelphia	**16.50**	16.00	16.00	14.50
Iron rails, Chicago	**17.50**	17.00	17.00	16.50
Iron rails, Philadelphia	19.50	19.50	19.50	19.00
Car wheels, Chicago	16.00	16.00	16.00	15.00
Car wheels, Philadelphia	*15.00*	15.00	15.25	14.50
Heavy steel scrap, Pittsburgh	16.00	15.75	16.00	14.75
Heavy steel scrap, Chicago	**14.75**	14.25	14.00	12.50
Heavy steel scrap, Philadelphia	**16.50**	16.00	16.00	14.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents	Cents.
Refined iron bars, Philadelphia	1.45	1.45	1.45	1.40
Common iron bars, Chicago	**1.37½**	1.35	1.35	1.50
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.40
Steel bars, tidewater, New York	**1.46**	1.46	1.41	1.56
Steel bars, Pittsburgh	**1.30**	1.30	1.25	1.40
Tank plates, tidewater, New York	**1.56**	1.51	1.46	1.76
Tank plates, Pittsburgh	**1.40**	1.35	1.30	1.60
Beams, tidewater, New York	**1.56**	1.51	1.30	1.76
Beams, Pittsburgh	**1.40**	1.35	1.46	1.60
Angles, tidewater, New York	**1.56**	1.51	1.30	1.76
Angles, Pittsburgh	**1.40**	1.35	1.46	1.60
Skelp, grooved steel, Pittsburgh	**1.35**	1.35	1.30	1.45
Skelp, sheared steel, Pittsburgh	**1.45**	1.45	1.40	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh*	**1.80**	1.80	1.70	1.95
Cut nails, Pittsburgh	**1.75**	1.75	1.70	1.75
Barb wire, galv., Pittsburgh*	**2.10**	2.10	2.00	2.40
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.50**	13.50	13.25	13.60
Electrolytic copper, New York	13.00	13.00	13.00	13.50
Spelter, New York	**5.60**	5.35	5.35	4.80
Spelter, St. Louis	**5.45**	5.27½	5.27½	4.70
Lead, New York	4.35	4.35	4.35	4.60
Lead, St. Louis	*4.20*	4.20	4.30	4.45
Tin, New York	**29.50**	29.30	29.00	30.70
Antimony, Hallett, New York	7.50	7.50	7.50	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.64	$3.64	$3.64	$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 20c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c., net; I-beams over 15 in., 1.50c., net; H-beams over 8 in., 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.45c., net; angles, over 6 in., 1.50c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.60c., base, half extras, steel bar card; tees, 3 in. and up, 1.50c., net; zees, 3 in. and up, 1.45c., net; angles, channels and tees, under 3 in., 1.35c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.65c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.25c.; No. 30, 3.60c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, 3½ to 6 in., are 77 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1½ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer, open hearth and chain rods, $31.

Steel Rivets.—Structural rivets, 1.70c., base; boiler rivets, 1.80c., base.

Chicago.

FISHER BUILDING, August 4, 1909.—(*By Telegraph.*)

In all of the heavier lines of finished steel products, with the exception perhaps of tubular goods, the question of deliveries is becoming the central feature of interest. The insistence of demand is strikingly illustrated by the record-breaking tonnage of steel bars specified in July, a month in which there is ordinarily but little business moving. Prompt shipments of steel bars, plates and shapes are no longer obtainable from any of the leading mills, nor in fact from any source, except warehouse stocks. On these lines rolling schedules are filled from four to eight weeks ahead and orders are accumulating more rapidly than they are being turned out. Billets for the time being are extremely scarce, though it is expected that the local supply will be largely increased within 30 days by the starting up of the new mill at Gary, which is nearing completion. While there has been considerable inquiry for forging and axle billets, only one transaction is reported and this is for 10,000 tons of the latter for September and October delivery. There is a steady increase in the volume of railroad buying. In addition to 5000 tons of new business in standard section rails booked last week by the Illinois Steel Company, there are inquiries out for 27,000 tons for which it is likely that orders will soon be placed. The prospect for continued industrial advancement through the West is unmarred by any complications likely to produce reaction. Operations in the iron and steel mills and in shops and factories are not being impeded by labor troubles, and other conditions seem to invite uninterrupted expansion.

Pig Iron.—This week's market was practically monopolized by the Northern furnaces, whose prices range from 35c. to 50c. a ton under those held by Southern producers for forward deliveries. The demand was fairly active in small lots ranging from 300 to 500 tons, in addition to which there were a few sales of 1000 to 2000 tons each. The principal transaction was the sale by a Northern producer of 6000 tons of No. 2 foundry for delivery through the first half of next year on a basis of $17.50, Milwaukee. This is the first deal of any magnitude in which the seller's attitude respecting prices for this period has been clearly outlined. With this exception no other sellers of Northern iron, and as far as known none of Southern iron have come out openly with a price for first half delivery. There has not been, in fact, an insistent demand from consumers for bookings that far ahead, but the growing firmness of prices is creating more interest in forward requirements, and it is probable that considerable business of this kind will come up in the near future. A prominent Milwaukee machinery interest has an inquiry out for 1000 tons of No. 2 foundry for delivery at Cincinnati to be furnished within the next three months. Prices have advanced far enough to show a fair profit on purchases made at the low point of a few months ago, and some iron bought speculatively at that time is coming into the market. A resale lot of this character amounting to 2000 tons was offered this week at Birmingham for December delivery, and tenders were made of another lot of 3000 tons. Northern iron is being strongly held by local furnaces at $16.50, at furnace. A sale of 2000 tons by a southern Ohio furnace to a St. Louis car builder at $14.50, at furnace, was followed, it is said, by the immediate withdrawal of this price. A limited amount of prompt Southern iron is still available from one source at least at $12.50, but the market as a whole is firm at $13, Birmingham. The following quotations are for August and September delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	17.00 to 18.00
Northern coke foundry, No. 2	17.00 to 17.50
Northern coke foundry, No. 3	16.50 to 17.00
Northern Scotch, No. 1	18.00 to 18.50
Southern coke, No. 1	17.85 to 18.35
Southern coke, No. 2	17.35 to 17.85
Southern coke, No. 3	16.85 to 17.35
Southern coke, No. 4	16.35 to 16.85
Southern coke, No. 1 soft	17.85 to 18.35
Southern coke, No. 2 soft	17.35 to 17.85
Southern gray forge	15.85 to 16.35
Southern mottled	15.60 to 16.10
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	17.90 to 18.15
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets and Rods.—The chief transaction in the local market last week was the sale of 10,000 tons of axle billets for September and October delivery. The finishing departments of all mills in this district are taking all the steel that can be turned out, and no billets are being offered for prompt delivery. One maker declined to quote on an inquiry for 5000 tons of axle billets. Forging billets, for which there is an active inquiry in small lots, are very firm and scarce, at $28, base, Chicago. Some wire rod tonnage is being booked at the new price of $31, Pittsburgh, and there is urgent demand for shipment of specifications which are freely offered.

Rails and Track Supplies.—To the original allotment of 111,000 tons awarded by the Harriman lines to the mills of the leading interest, there has been added 5000 tons for next year's delivery, which has been taken by the Illinois Steel Company. New rail inquiries in the market include 20,000 tons from the Chicago, Burlington & Quincy and 7000 tons from the Baltimore & Ohio. No new rail orders for delivery from the South Works of the Illinois Steel Company prior to December or from Gary before the middle of October are being booked; all business requiring earlier delivery is being diverted either to the Carnegie or Ensley mills. Orders for track supplies are very heavy and the mills are unable to make shipments fast enough to supply the wants of the roads. Business in light rails is fair, but the tonnage is not accumulating as fast as in other heavy lines. There has been some talk of an advance in light rail prices, but no change has yet been made, although the market is absolutely maintained at the following quotations: 40 to 45 lb. sections, $26; 30 to 35 lb. sections, $26.75; 16, 20 and 25 lb. sections, $27; 12-lb. sections, $28, Chicago, less 50c. a ton on lots of 500 tons and $1 a ton on lots over 500 tons.

Structural Material.—The largest individual contract placed last week was that of the Kansas City Winner Bridge for 13,500 tons, which was secured by the McClintic-Marshall Construction Company. The American Bridge Company has entered 5000 tons for the new by-product coke plant and other structures now being erected at the Gary Steel Works; an order for 867 tons for the construction of a viaduct at Sioux City also went to the same interest. A contract for a drawbridge at Houston, Texas, requiring 243 tons, was taken by the Wisconsin Bridge Company. A contract for 155 tons for the Portland Gold Mining Company, Colorado Springs, Col., and one of 350 tons for the Adolph Coors malthouse, Denver, Col., were awarded to the Minneapolis Steel & Machinery Company. Figures are being taken on about 7000 tons for the new steel freight car shops to be built by the Pullman Company; also on 6500 tons for the erection of the new Sherman House in this city. Wrecking of the old hotel, which now occupies the site of the new building, will begin about September 1. It is understood that Bethlehem shapes have been specified on 2500 tons for

the Old National Bank, Spokane, Wash. Delay in getting material from the mills is holding back deliveries of fabricated work, but the leading shops are well filled up with work and are not in position to furnish early shipments in any case; orders, in fact, are coming in faster than they can be executed. This condition of affairs should have a further tendency to advance prices, which are now from $8 to $10 above the extreme low point reached; the market is gradually firming up, but not as rapidly as could be desired. The mills are getting further and further behind on plain material; local mills are specified up for 10 to 12 weeks ahead. The absolute minimum on shapes is reported as 1.58c., base, Chicago.

Plates.—While work is not piling up at the mills as fast in plates as in shapes, specifications are coming in at a rate exceeding production. The car shops are contributing a liberal amount of business, several round lots having lately been received from this source. Fabricating shops are also calling for a larger amount of material. Shipments earlier than 30 days from receipt of order are not being offered by any of the mills, and not many are in position to do as well as this. Such conditions naturally divert business to jobbers who are being looked to for prompt requirements. Mill prices are firm at 1.58c., base, Chicago.

Sheets.—Business continues to increase and the volume now being offered is large enough to fill comfortably the present active mill capacity, some of it being filled for several weeks ahead. Orders for delivery inside of six weeks are being refused by the local mill, which has advanced prices on blue annealed to a basis of 1.70c., Pittsburgh, for No. 10. Box annealed and galvanized are unchanged, but current prices are no longer subject to shading of any consequence. Jobbers' stocks are perforce being resorted to for immediate requirements.

Bars.—All previous records of the Illinois Steel Company for specifications on steel bars were broken in July when 50,000 tons were booked. Only a small amount of new business is being entered at the prices now ruling, but the mills are now badly behind on deliveries against existing contracts. The Bay View mills are provided with specifications for three months ahead, and other Western mills are unable to promise shipments inside of six to eight weeks. The demand for bar iron is improving. One of the local mills has its rolling schedule filled 30 days ahead and all others are running fuller. Bar iron prices also have firmed up to a minimum of 1.37½c., and some business is being booked at 1.40c.

Merchant Pipe.—Rumors forecasting an advance on steel pipe to be announced August 2 were without foundation. No such advance has taken place, but the general trend of values in the heavier finished lines of iron and steel naturally lead to the assumption that an upward step in pipe prices may be taken at any time. The demand for merchant pipe from jobbers held even through July, without much increase over the previous month. A livelier movement is looked for from now on through the fall season.

Boiler Tubes.—Nothing of noteworthy interest has developed in the market either as respects merchant or locomotive tubes. Both continue quiet, trade being restricted to the small lots required to meet current needs.

Cast Iron Pipe.—The only letting reported for last week was one of 700 tons, which was awarded to a contractor. Bids will be opened August 11 on 500 tons to be purchased by Glasgow, Mont. Several Western irrigation projects are coming into the market for lots of moderate size. Although steel pipe is largely used for this work, there is an increasing amount of inquiry for cast iron pipe for irrigation mains. Inquiry for small lots from various sources keeps up well. All of the shops of the leading interest are going, but are running light in some departments, especially in those making large pipe. We quote per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16-in. and up, $25.50, with $1 extra for gas pipe.

Metals.—The demand has picked up slightly in the past week, but buying is confined mainly to the requirements of small consumers. Copper prices remain unchanged, but the general tone of the market is weaker. The same is true of lead and spelter. Old metals are easier and the market throughout lacks the support necessary to insure stability. Quotations are as follows: Casting copper, 13⅛c.; lake, 13⅝c. to 13¾c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.40c. to 4.50c., for 50-ton lots; corroding, 4.65c. to 4.75c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; spelter, 5.35c. to 5.45c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11¼c.; copper clips, 12¼c.; red brass, 11½c.; yellow brass, 9¼c.; light brass, 6¾c.; lead pipe, 4½c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—Fresh impetus given to the rising tendency of prices last week was apparently not due to any specific cause, but rather to the general sentiment of confidence created by the remarkable vigor of the iron and steel industry. A list of material offered by the Chicago, Burlington & Quincy early in the week brought only fair prices as compared with current quotations, but one closed later in the week by the Northwestern brought prices which indicate an advance of 50c. a ton on nearly all grades. Melting steel is especially strong, and it is said that not all the short sales made by dealers some months ago have been covered. Recent transactions in melting steel have included no round lots, but most of the large consumers are quietly taking in material as occasion offers. The fuller operation of bar iron and rerolling steel mills means larger consumption of rolling mill grades. One independent interest has within the past two weeks accumulated about 10,000 tons. The hardening of pig iron prices is reflected in better values of cast scrap; foundry consumption is gradually broadening. Generally speaking, dealers have until lately hesitated to sell at current market prices for forward delivery, but the past week has developed a spirit of confidence which foreshadows a strong movement in this direction. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails	$17.50 to $18.00
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft.	15.25 to 15.75
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	16.00 to 16.50
Heavy melting steel scrap	14.75 to 15.25
Frogs, switches and guards, cut apart	14.75 to 15.25
Shoveling steel	13.50 to 14.00

The following quotations are per net ton:

Iron angles and splice bars	$16.00 to $16.50
Iron car axles	18.75 to 19.00
Steel car axles	17.75 to 18.25
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.50 to 14.00
Springs, knuckles and couplers	13.50 to 14.00
Locomotive tires, smooth	14.00 to 14.50
No. 1 dealers' forge	11.50 to 12.00
Steel axle turnings	10.00 to 10.50
Machine shop turnings	8.25 to 8.75
Cast and mixed borings	5.75 to 6.25
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.25 to 8.75
No. 1 boilers, cut to sheets and rings	10.50 to 11.00
No. 1 cast scrap	14.00 to 14.50
Stove plate and light cast scrap	11.50 to 12.00
Railroad malleable	13.50 to 14.00
Agricultural malleable	12.00 to 12.50
Pipes and flues	10.25 to 11.25

Birmingham.

BIRMINGHAM, ALA., August 2, 1909.

Pig Iron.—The market for prompt shipments and deliveries covering the remainder of the year is believed to be correctly represented by a schedule of $13, Birmingham, on a No. 2 foundry basis. As has been the case for some weeks, recent engagements have in the main involved comparatively small lots and the aggregate sold is not indicative of a disposition among prospective purchasers to meet the views of sellers. No concessions have been made in the matter of price, however, and to-day probably only one concern in the Birmingham District is solicitous of orders. The largest producing interest refuses to quote on any deliveries and three others are practically out of the market by reason of prohibitive asking prices. It is believed that the trade generally is more interested in advanced deliveries than at the time of last report by reason of the increased volume of inquiries. A disposition to feel the market for early 1910 deliveries is very much in evidence, but, so far as is known, even nominal quotations have not been elicited. The extent to which melters have provided for fourth quarter requirements through third quarter engagements is a question of considerable import. The tonnage that has been engaged for fourth quarter delivery, according to the various reports, is comparatively insignificant, but an increase in the rate of production has been made from time to time without a perceptible effect on stock accumulations, and there is no good reason to believe that the actual consumption has increased at a rate commensurate with the increase in the output. It has been conceded that the situation is practically in the hands of furnace interests, but it remains to be seen just to what extent the fourth quarter asking prices will be realized in that period.

Cast Iron Pipe.—Local producers have practically disposed of their entire output for some months in advance and are not solicitous of additional orders at the prices necessary by reason of recent sharp competition. The output in the Southern territory has been increased by the resumption of operations at the plant of the Sheffield Cast Iron Pipe & Foundry Company at Sheffield, Ala. This capacity, which is the last of the idle plants, is understood to have been provided for some months since. The latest development in the cast iron soil pipe market is the withdrawal of quotations by a leading interest. We quote soil pipe prices as unchanged and water pipe nominally at the figures last published. Water pipe quotations are, per net ton, f.o.b. cars here, 4 to 6 in., $26; 8 to 12 in., $25; over 12 in., average $24, with $1 per ton extra for gas pipe. These quotations, while not considered prohibitive, are nominal.

Old Material.—The attention of local dealers is largely

turned toward meeting the demand for light cast and stove plate, resulting from the advance in price of spot delivery pig iron. Last week's records will probably show a higher average price for such grades as were involved, but as a whole the market is unchanged, with the outlook more favorable than for many months. We quote dealers' asking prices per gross ton, f.o.b. cars here, as follows:

Old iron rails	$14.00 to $14.50
Old iron axles	14.50 to 15.00
Old steel axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	9.00 to 9.50
No. 1 machinery	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Light cast and stove plate	9.00 to 9.50
No. 1 steel	10.50 to 11.00
Cast borings	4.50 to 5.00

Philadelphia.

PHILADELPHIA, PA., August 3, 1909.

The markets for practically all classes of crude and finished material are decidedly strong. Buyers continue to come into the market, both for early as well as forward deliveries, and heavy tonnages have been sold, in the majority at slightly higher prices. There has been some extensive buying of basic pig iron for delivery in the first quarter of next year at advanced prices, and this grade for early delivery is becoming rather scarce. Finished materials are being freely taken; buyers are anixous to cover for their needs for the balance of the year, but find few sellers who are willing to sell for deliveries beyond the next 30 or 60 days, even at the present higher range of prices. The railroads show more freedom in placing orders for motive power and rolling stock. The Pennsylvania Railroad has just announced the placing of orders for 8000 freight cars to replace old equipment. The general demand is larger in nearly every line than was expected at this time, and with the present capacity, which is, however, rapidly being added to, most producers have fully as much business offered as can well be taken care of. Persistent rumors prevail that arrangements have been made by which nearly all the steel mills in this territory will purchase their supplies of heavy melting steel scrap through one merchant. While the leading consumers neither confirm nor deny this report, it is believed that such a plan will be experimented with for a limited time.

Pig Iron.—The feature of the market has been the active movement of basic iron. The week's purchases of this grade aggregate fully 55,000 to 60,000 tons, the larger proportion for delivery early next year. Some 20,000 tons has been taken for shipment over the balance of this year at prices averaging $16.50, delivered, while that taken for the first quarter of 1910 has been all done at $17, delivered. Prompt basic is comparatively scarce, and with some makers commands fully as high a price as for forward delivery. Basic iron now commands practically the same price as No. 2 X foundry. The active demand for steel products has increased the demand and steadily advanced the price of basic, while the call for foundry has not been so active. The price movement of these two grades is being watched with interest and supply and demand will doubtless be the governing factor. The Pennsylvania Railroad has, it is understood, closed for the tonnage recently inquired for; some round lots of No. 2 X and No. 2 plain have also been booked, but the bulk of the business has been of a retail character, at prices showing considerable variation, but all exhibiting an upward tendency. Several sellers have advanced prices at the furnace and with a number of them $16.50 at furnace is now named as a minimum price for No. 2 X foundry for comparatively early delivery. Some little iron of this grade, however, is still to be had at $16.75, delivered, and the bulk of the sales have been at prices ranging from $16.75 to $17. Sellers maintain a very firm position, the majority being pretty well sold up, at least as far as their capacity for the next few months is concerned, and they are not disposed to sell for more extended deliveries. Moderate tonnages, for delivery during the balance of the year, are occasionally taken, but, as a rule, sellers refuse to quote on foundry grades for shipments extending into next year. The higher level of prices will undoubtedly result in an increase in the present active capacity, and orders have already been given to prepare idle stacks for blowing in. Virginia foundry grades have not been active; most sellers are now pretty well sold up and refuse to accept further tonnages at the present range of prices, preferring to withdraw from the market. The lots sold have usually been small and for prompt shipment at unchanged prices. Southern foundry iron is firm, but little business has been done, as the present range of prices is now higher than for the leading Northern irons. There has been a better movement in forge iron, and prices show an advance of about 20c. a ton. A fair quantity of this grade has been taken by the rolling mills at prices ranging from $15.75 to $16, dependent on quantity and delivery. The cast iron pipe foundries are inquiring quite freely for low grade irons, but are not inclined to place any heavy business at the present range of prices, which are higher than they wish to pay. While there is some inquiry for low phosphorus pig, little local business has been done, but sales of several small lots for Western delivery are reported at prices equal to $20, delivered here. Sellers maintain prices on all grades of pig iron very firmly, and little effort is made to force sales. Producers prefer to hold back their product for a higher range of prices, which they feel sure will develop if the present active condition of business continues. Quotations on nearly all grades range slightly higher, dependent on quantity and delivery, the following schedule representing the range for delivery in buyers' yards, eastern Pennsylvania and nearby points, for the balance of the year:

Eastern Pennsylvania, No. 2 X foundry	$16.75 to $17.25
Eastern Pennsylvania, No. 2 plain	16.25 to 16.75
Virginia, No. 2 X foundry	16.75 to 17.00
Virginia, No. 2 plain	16.50 to 16.75
Gray forge	15.75 to 16.00
Basic	16.50 to 17.00
Low phosphorus	20.00 to 20.50

Ferromanganese.—Little new business has developed in this territory and the market is rather dull. Several small sales have been made at $41.50, Baltimore, for September-December delivery, on a $4 duty basis. Some tonnage for Western delivery at a slightly higher price for first quarter of next year is reported. For delivery over the balance of the year $41.50 to $42, Baltimore, is named, with $42 to $43 for delivery in the first half of 1910.

Billets.—The demand is heavier and prices show an advance of $1.50 to $2 a ton for prompt shipment. The quantities sold are increasing in size and more inquiry is noted. Makers still refuse to consider orders for extended delivery, confining themselves to reasonably prompt shipments, for which ordinary rolling steel delivered in this territory is now quoted at $27, with forging steel at $29, the usual extras for high carbons and special sizes being added.

Plates.—A large volume of business continues to come out and mills in several cases are offered more than they can conveniently handle. Orders are heavier individually and sellers are less inclined to accept contracts for extended deliveries unless accompanied with specifications. Buyers are willing to cover their future requirements, but mills, as a rule, show no interest in business of that character. Bridge and steel car material continue the most active, although there is an active demand for locomotive plates. The market is very strong and prices have been pretty generally advanced to 1.55c. minimum for the ordinary run of business for local delivery.

Structural Material.—Business is of a very satisfactory character. A comparatively good volume of orders for small bridge work has been taken by mills and fabricators, and some large tonnages are still pending. Mills are running at full capacity, and the demand for some classes of plain material is such as to make it difficult to promise prompt shipments. Prices show a further slight advance, and plain shapes are now pretty generally quoted at 1.55c. to 1.65c., delivered, dependent on specification and tonnage.

Sheets.—Mills are running at full capacity and have more orders on hand than for some time. Current business is largely of a prompt nature, although slight advances are obtained for extended deliveries. Prices for reasonably prompt shipment are unchanged, ranging as follows for delivery in this vicinity: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—The demand has not been active. Some fair business has come out, but mills generally will not accept orders for extended shipment at prevailing quotations. Prices are somewhat firmer, although no general advance is noted. Refined iron bars for delivery in this territory continue to be quoted at 1.45c. to 1.50c. Steel bars are firmer, at 1.45c., delivered.

Coke.—Some scattered business has been done in foundry coke, largely for prompt delivery, at $2.25, at oven, for the better grades. Little buying has yet developed in furnace coke, and prices, while in some instances firmer, show little change. For delivery in this territory the following range of prices is named:

Connellsville furnace coke	$3.90 to $4.10
Foundry coke	4.35 to 4.50
Mountain furnace coke	3.50 to 3.70
Foundry coke	3.80 to 4.10

Old Material.—The leading feature of the market has been the persistent rumor of an arrangement by which the leading steel mills in the East would purchase their requirements of heavy melting steel scrap through one of the leading merchants in this city, thereby withdrawing from the general market. Although those thought to be interested neither confirm nor deny the report, it is believed that the plan will be tried out for a limited period. The fact that but few of the mills are in the market while it is understood that some are comparatively short of scrap lends color to the report. Transactions in steel scrap have been comparatively light, while sellers, as a rule, are holding material for a higher level. Rolling mill scrap shows an advance on light purchases. Choice No. 1 railroad wrought

is full 50c. dearer, while other specialties show a sharp advance. Quotations, while nominal to a certain extent, range about as follows, for delivery in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$16.50 to $17.00
Low phosphorus	20.00 to 20.50
Old steel axles	21.50 to 22.50
Old iron axles	24.00 to 25.00
Old iron rails	19.50 to 20.50
Old car wheels	15.00 to 16.00
Choice No. 1 R. R. wrought	18.00 to 18.50
Machinery cast	15.00 to 15.50
Railroad malleable	14.50 to 15.00
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	14.00 to 14.50
No. 2 light iron	9.50 to 10.00
Wrought turnings	13.00 to 13.50
Stove plate	12.50 to 13.50
Cast borings	11.00 to 11.50
Grate bars	13.50 to 14.00

Pittsburgh.

PARK BUILDING, August 4, 1909.—(*By Telegraph.*)

Pig Iron.—Heavy inquiries come from the East for both Bessemer and basic, aggregating upward of 50,000 tons. Consumers want deliveries into next year on some of this, but the furnaces object to selling so far ahead at present prices, and most of the inquiries are being turned down for this reason. One local interest is shipping basic iron East for one of its steel finishing mills, being unable to get iron from local furnaces, and will probably have to replace this tonnage by buying Bessemer pig in the open market. Prices are firm. We quote Bessemer iron at $16; basic, $15.25; No. 2 foundry, $15.25; malleable Bessemer, $15.25, and gray forge, $14 to $14.25, all at Valley furnace, the freight rate to Pittsburgh being 90 cents a ton. We note sales of about 2000 tons of Bessemer for shipment East on the basis of $16 at Valley furnace.

Steel.—The steel market continues very active, inquiries being heavy and there does not seem to be enough steel to go round. Premiums are being paid for prompt deliveries. We quote Bessemer billets at $24 and open hearth at $25, f.o.b. mill, full freight to destination added. Some sellers are holding Bessemer billets at $25 and open hearth at $26, but no sales are reported at these prices. Sheet and tin bars are firm at $25.50 to $26 in random length and forging billets are $28 minimum.

Coke.—Some heavy sales of furnace coke have been made for delivery both through first half and through all of next year. One leading consumer has contracted for 10,000 tons a month through all of next year. Some contracts have been made on the basis of 8 tons of coke for 1 ton of basic or Bessemer iron, f.o.b. Valley furnace, but some of the coke makers are now quoting on the basis of 7 tons of coke for 1 ton of iron.

(*By Mail.*)

Instead of a falling off in new business and a possible recession in prices, predicted some time ago to come in July or August, the reverse is the case. The mills are getting an enormous amount of new business, which advances in prices do not seem to have any effect in shutting off. There probably never was a time in the history of the steel business when so much new work was under way and when so much new tonnage was being booked as at present. Consumers seem convinced that the whole tendency of the market is toward higher prices, and they are trying to get under cover as quickly as possible. Several large steel makers have reached a point in filling their order books at which they are turning down inquiries which, either from the price or from the specifications, do not appear desirable. Three or four of the leading interests report that orders going through the mills in July have been the heaviest in nearly two years, and the outlook is that August will be as large or larger. The pig iron market is very strong, standard Bessemer being firm at $16, at Valley furnace, with only a limited tonnage to be had at that price. Basic commands $15.25 to $15.50, a number of leading sellers holding their iron for the higher figure. The demand for foundry iron, which has been only fair, shows signs of increasing, as the foundries are getting busier. The available supply of steel has almost reached the famine stage and prompt deliveries of billets and bars are hard to obtain. One leading maker of steel has set its minimum price on Bessemer rolled billets at $25 and on open hearth at $26. In such finished lines as plates, structural material, sheets and pipe the new demand is heavy, and the mills entered August with a larger amount of business on their books than at any time for more than a year and a half. There is a growing tendency on the part of producers to refrain from selling, in the belief that in a short time they will be able to get better prices than are now ruling. This is particularly true in the pipe trade.

Ferromanganese.—The market is firm. While a good many of the leading consumers have pretty well covered their requirements ahead, some as far as July 1 of next year, there is a fair amount of inquiry. We continue to quote foreign 80 per cent. for delivery over the balance of this year at $41.50 to $42, seaboard, while for delivery through the first half of next year $43 is asked. A sale of 150 tons of foreign 80 per cent., 30 tons a month, August to December, is reported at $42, seaboard, the freight to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Consumers are endeavoring to anticipate the higher duty on ferrosilicon imposed by the new tariff and are trying to cover for as much as possible. A good deal has been sold in the past two weeks at about $62, Pittsburgh, duty at the buyer's risk.

Rods.—Consumers of rods covered their requirements for some time ahead prior to the late advance, and as a result the demand is now light and is only for small stray lots. Specifications against contracts are coming in very freely, and shipments by the mills are heavy. We quote Bessemer, open hearth and chain rods at $31, Pittsburgh.

Muck Bar.—A sale of 1000 tons of standard grade of muck bar made from all pig iron is reported at $28, Pittsburgh. The market on best grades is very firm at this price; one maker is understood to be asking $28.50, Pittsburgh, and will not shade this price.

Skelp.—The demand is active, and prices are firm. One local mill rolling grooved and sheared iron plates is now running full for the first time in nearly two years, with plenty of work booked. We quote grooved steel skelp at 1.35c. to 1.40c.; sheared, 1.45c. to 1.50c.; grooved iron, 1.55c. to 1.60c., and sheared iron skelp, 1.60c. to 1.65c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—July bookings of the Carnegie Steel Company, in both light and standard section rails, were the heaviest for any one month for more than a year and a half. Some fairly large new orders for standard sections were received in the past week, as well as some good specifications against contracts; light rail orders and specifications amounted to 2600 tons. Splice bars are held at 1.50c., Pittsburgh, and a good deal of business is being placed. We quote standard sections at $28, at mill, and light rails as follows: 8 to 10 lb., $34; 12 and 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, f.o.b., Pittsburgh. One leading maker of light rails, located outside the Pittsburgh District, is quoting about $1 a ton higher than these prices, but equalizes freights with Pittsburgh. The market is so strong that higher prices on light rails in the near future are likely.

Plates.—The largest individual order for steel cars during the week was that of the Pennsylvania Railroad, which placed contracts for 8000 freight cars. Of this number 4845 cars will be for use on the lines east of Pittsburgh and Erie and 3155 for the lines west. The Pressed Steel Car Company got of this order 350 box cars, 350 hopper cars and 500 coke cars; American Car & Foundry Company, 500 box cars; Standard Steel Car Company, 750 cars, and Cambria Steel Company 500 coke cars. The railroad company will also build 895 cars in its Altoona shops. The plates and shapes for the cars to be built by the Pressed and Standard companies will be furnished by the Carnegie Steel Company, while the plates and shapes for the cars to be built by the American Car & Foundry Company will be furnished by the Jones & Laughlin Steel Company. Other smaller orders for cars have been placed by different roads, but details have not been given out. The leading mills making plates and shapes have heavy inquiries from the car building companies and the whole plate market is much more active. The Carnegie Steel Company has advanced its prices on plates squarely to 1.40c., and will not enter orders at less than that price. It is predicted that before the end of August ¼-in. and heavier plates will be 1.50c. at mill. We quote ¼-in. and heavier at 1.40c., minimum f.o.b. Pittsburgh, and on small orders 1.45c.

Structural Material.—An important contract calling for 15,000 tons or more of structural shapes has been taken by the McClintic-Marshall Construction Company, but details are not yet ready to be given out. The addition to the plant of the Standard Steel Car Company at Butler, Pa., about 6000 tons, has been held up and may not come out for some time. A good deal of work has been placed in the past week, made up of small orders, but which aggregate considerable tonnage. The structural shops are all busy and prices for fabricating are showing some betterment. The absolute minimum of the market on beams and channels up to 15 in. is now 1.40c., the Carnegie Steel Company having made an advance in plates and shapes of $1 a ton a few days ago. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh, and on small orders 1.45c.

Bars.—The steel bar mills entered August with more work on their books than at any time in nearly two years, and several of the leading steel bar mills are now from four to six weeks behind in shipments. New demand is not very heavy, as most consumers are covered with contracts, but prices are very firm. The absolute minimum of the market on steel bars is 1.30c., Pittsburgh, with one large maker quoting 1.35c., at mill. The demand for iron bars is fairly active, and specifications against contracts are coming in freely. We quote common iron bars at 1.45c., Pittsburgh.

Tin Plate.—The American Sheet & Tin Plate Company is steadily increasing its list of active hot tin mills in its plants affected by the strike, additional mills having been started in the past week at the American Works, at Ellwood, Ind., and at the Shenango and New Castle works, at New Castle, Pa. The company believes that in a short time it will have sufficient men to operate all its serviceable tin mills to full capacity. New demand for tin plate at present is quiet, as this is the dull season of the year in this trade. Prices are firm, and we quote 100-lb. cokes at $3.40 per base box, f.o.b. Pittsburgh.

Sheets.—July was by far the best month in point of new orders and specifications against contracts that the sheet trade has known in nearly two years. New orders are coming in very freely, while buyers are specifying liberally against contracts. Cutting in prices has about disappeared. We quote one-pass box annealed black sheets, No. 28 gauge, at 2.20c., and No. 28, galvanized, at 3.25c. The regular price of painted roofing sheets, No. 28, is 1.55c. per square, and of galvanized, No. 28, is 2.80c. per square, for 2½-in. corrugations.

Hoops and Bands.—New demand for both hoops and bands is active, consumers trying to contract for as much material ahead as they possibly can in the belief that prices will be higher. We quote hoops at 1.50c. to 1.55c. and bands at 1.25c. to 1.30c., steel bar card extras applying on the latter.

Rivets.—Some large orders are being placed for boiler and structural rivets and mills making this product have more actual business on their books than at any time in nearly two years. Prices are not only firm, but show a tendency to advance.

Shafting.—The demand for shafting is very active, and the makers are sending more orders through the mills than for a long time. Prices are being maintained. We quote cold rolled shafting at 60 per cent. off in carloads and 55 per cent. in less than carloads, delivered in base territory.

Spikes.—While no large contracts for spikes have recently been placed, a good many of the railroads are buying quite freely. Prices are firm. We quote $1.65 for railroad spikes, 4½ x 9-16 in. and larger, and for smaller sizes and boat spikes $1.70, base, subject to standard card extras, with an advance of 5 per cent. in less than carload lots.

Merchant Pipe.—The Buffalo gas concern that was in the market for about 60 miles of 3 to 8 in. pipe has decided not to buy new pipe, but will lift a line in Indiana and relay it in New York. Reports are still current that there will be an early advance in prices, but nothing official has been given out. Several of the independent mills that have a good deal on their books are practically out of the market, in the belief that prices will be higher in the near future. The official discounts on black steel pipe ¾ to 6 in. are 81 and 5 and on iron pipe ¾ to 6 in. 77 and 5 in carload and larger lots to the largest trade.

Boiler Tubes.—Orders for locomotive tubes are more numerous, but as yet the railroads are buying mostly for repair work. It is believed that in the very near future the demand will be much heavier. New demand for merchant tubes is also showing some betterment, but as yet there is not enough business in either locomotive or merchant tubes to give the mills full work. Regular discounts continue to be shaded.

Coke.—The demand for both furnace and foundry coke is more active than for some time. Three or four large inquiries for furnace coke for first half of the year are in the market. A number of blast furnaces buy their coke on an exchange basis (so many tons of coke for one ton of iron), and some negotiations are now under way having as a basis 8¾ tons of standard furnace coke for one ton of basic iron, but as yet none of this business has been closed. The output of coke in the Upper and Lower Connellsville regions and in other regions as well is nearly back to normal again, the Upper and Lower Connellsville regions having made last week about 385,000 tons. Standard makes of furnace coke for prompt shipment are now held at $1.70 and 72-hour foundry coke at $1.90 to $2 a net ton at oven.

Iron and Steel Scrap.—The scrap lists of the Pennsylvania Lines West, the Erie and the New York Central closed Tuesday at 10 a.m., and as these lists are pretty heavy, the bids made by the dealers will give a pretty clear idea of ruling prices. The scrap trade is showing some betterment, inquiries being a little better, while prices are a shade firmer than they were last week. While two of the leading scrap consumers have not been buying much recently, one of them has come in the market in the last week and has quietly bought several fair sized lots of heavy steel scrap and other grades. Dealers quote about as follows per gross ton: Heavy steel scrap for Monessen, Sharon, Follansbee, Leechburg, Steubenville and in the Pittsburgh District, $16; cast iron borings, $9.50 to $9.75; bundled sheet scrap, $14.75, delivered at consuming point; No. 1 cast scrap, $15 to $15.25; No. 2, $14.50 to $14.75; No. 1 railroad malleable scrap, $15; grate bars, $12.75 to $13; No. 1 busheling scrap, $14 to $14.25; No. 2, $10.50 to $10.75; low phosphorus melting stock, 0.04 and under, $19.50; locomotive tires, $18; locomotive axles, $24.50 to $25; machine shop turnings, $11.50 to $11.75; rerolling rails, delivered at Columbus, Ohio, $16.75; old car wheels, $16.25 to $16.50; iron axles, $24.50 to $25; stove plate, $10 to $10.25, and steel axles, $20. Sheet bar crop ends are a little lower in price, the leading consumer in this district being out of the market, and we quote them at $16.50. All above prices are f.o.b. cars, Pittsburgh, unless otherwise stated. Sales have been made as follows: 2000 tons of rerolling rails at $16.75, delivered; 300 tons of iron axles at $24.75; 1000 tons of bundled sheet scrap at $14.75, delivered at consuming point, and 500 tons of heavy steel scrap at $16, delivered.

John K. Fry, for some years connected with the firm of Banning, Cooper & Co., iron and steel factors, Lewis Building, Pittsburgh, has withdrawn, effective July 31. The business will be continued by Banning, Cooper & Co., with C. F. Banning chairman, S. G. Cooper president and Floyd K. Smith secretary and treasurer.

The transportation, supply, coal and coke departments at Pittsburgh of M. A. Hanna & Co., Cleveland, have been moved from the Lewis Block to the sixth floor of the People's National Bank Building, Pittsburgh, where the pig iron sales office, in charge of Eliot A. Kebler, is now located.

M. K. Frank, Frick Building, Pittsburgh, has opened a rail yard at Terminal Way and the Pittsburgh & Lake Erie Railroad, South Side, Pittsburgh. The yard has excellent shipping facilities. It is connected with all railroads entering the city and switching charges are thus eliminated, while a dock on the bank of the Monongahela River enables shipments to be made by water. The yard facilities permit of handling material with economy. A large stock of relaying rails is being stored in the yard.

Cleveland.

CLEVELAND, OHIO, August 3, 1909.

Iron Ore.—A number of inquiries are pending for small lots. These are mostly from consumers who have been holding off till late in the season to cover for their year's requirements. It is believed that some furnace interests that have been holding off until the tariff question was settled will now come in the market. Nearly all the merchant ore firms are already well sold up, and the general condition of the trade is regarded as very satisfactory. Eastern consumers have so far bought less lake ore than usual this year, and sales that have been made to them have been mostly second grade ores. The effects of the severe storms that interfered with mining operations and with shipments during the last week of July are still being felt, and the movement down the lakes is not as heavy as two or three weeks ago, boats being delayed somewhat for cargoes. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—A fair demand is observed for foundry iron in small lots and a number of inquiries are pending both for the last and first half. Prices remain stationary and firm. For the first quarter of next year some tonnage is reported sold at $15.25 to $15.75, Valley furnace, for No. 2, but the usual asking price is from $15.50 to $16 for that delivery. Local furnaces are holding to $16 for the first half and have sold a small tonnage at that price for Cleveland delivery. For the last half prices are firm at $15.25 to $15.50, Valley furnace, for No. 2. Local furnaces are getting $15.75 to $16, delivered, Cleveland, for the balance of the year. We note the sale of two 300 ton lots of No. 2 foundry by a local furnace for outside shipment for the last half, one lot at $15.25, at furnace, and the other at $15.50, and 100 tons of No. 1 at $16, local furnace, for the last half. Among the sales for delivery after the first of the year was a small lot for shipment to Pittsburgh from Cleveland during the first quarter at $15.50, furnace, making the delivered price $16.90. Among the inquiries pending is one from a local pipe foundry for 2000 tons of No. 3 for the last half, and two from Erie, Pa., one for 500 tons of No. 2 for the last quarter and the other for 1100 tons for the first half. The melt in this district shows improvement and shipping orders are very satisfactory. The United Steel Company, Canton, has an inquiry out for 5000 to 6000 tons of basic iron for delivery over the balance of the year and there are inquiries pending from Chicago for 3500 tons of malleable and 5000 tons of basic. We quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern foundry, No. 1	$16.25 to 16.50
Northern foundry, No. 2	15.75 to 16.00
Northern foundry, No. 3	15.25 to 15.50
Southern foundry, No. 2	16.85 to 17.35
Gray forge	14.90 to 15.25
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—The demand for both grades shows considerable improvement and prices are firmer. A number of inquiries are out for furnace coke for the first half and the whole of next year, but producers are as yet unwilling to quote prices

that would be seriously considered by the consumers. On an inquiry for 10,000 tons of furnace coke for August and September delivery no price quotation was received below $1.85. We quote standard Connellsville furnace coke at $1.80 to $1.85 per net ton at oven on contract for the balance of the year. Standard 72-hr. foundry coke is held at $1.90 to $2.15 for spot shipment and $2.15 to $2.40 on contract for the balance of the year.

Finished Iron and Steel.—Three independent producers have advanced their price on steel bars $1 a ton to 1.35c., Pittsburgh, leaving only the leading interest and one independent interest on the old basis of 1.30c., Pittsburgh, and the quoted prices are being firmly maintained. Not a large volume of new business is coming out, but specifications on contracts continue heavy, only one or two mill agencies reporting any falling off, and deliveries on steel bars and structural material are falling further behind. Among the new business placed was a contract for 2000 tons of plates and shapes given to the leading interest by the American Shipbuilding Company for a passenger lake boat, the contract for which has just been closed by the Erie & Western Transit Company of Buffalo, known as the Anchor Line. In structural lines 1000 tons of shapes will be needed for the grand stand to be erected in the Cleveland baseball park, for which it is expected the contract will be closed this week. A large amount of small structural work continues to come up for which fabricators are specifying heavily on contracts. Considerable complaint is being made of slow deliveries on steel bars and shapes, which extend from 5 to 10 weeks. A local bolt and nut manufacturer, being unable to obtain deliveries as fast as needed, has decided to use a considerable tonnage of iron bars instead of steel in making its products. Some steel bar tonnage has been sold on contract for the balance of the year delivery at 1.35c., Pittsburgh. The demand for iron bars is fairly good, but prices are somewhat irregular; we quote 1.40c. to 1.50c., Cleveland, the latter price being well maintained for local delivery. The demand for plates is holding up well; all the mill agencies are quoting 1.40c., Pittsburgh, as the minimum, and mills able to make prompt shipments are getting $1 a ton premium. Structural material is firm at 1.40c., Pittsburgh, and one mill has advanced its price to 1.45c. The demand for sheets continues good and mills appear less anxious to get business than a month ago. Sheet prices are being firmly maintained. The demand for spikes continues good and present prices are being maintained. Both mill and warehouse orders with jobbers continue good, and July sales showed an increase over June. One local jobber reports an advance of $2 a ton in warehouse prices on steel bars, plates and shapes. The demand for wrought iron pipe is now very good.

Old Material.—There has been considerable buying among dealers, but not much has been sold to consumers. Prices are very firm and an advance of 50c. a ton is noted in heavy melting steel and some other grades. Dealers feel that prices will be higher within a few weeks and some of them are willing to buy in large quantities at to-day's prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$15.50 to $16.00
Old iron rails	17.00 to 17.50
Steel car axles	19.00 to 19.50
Old car wheels	15.00 to 15.50
Heavy melting steel	15.00 to 15.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$17.50 to $18.00
Cast borings	7.50 to 8.00
Iron and steel turnings and drillings	9.50 to 10.00
Steel axle turnings	10.50 to 11.00
No. 1 bushelling	13.00 to 13.50
No. 1 railroad wrought	14.50 to 15.00
No. 1 cast	13.00 to 13.25
Stove plate	11.00 to 11.50
Bundled tin scrap	10.00 to 10.50

St. Louis.

ST. LOUIS, August 2, 1909.

As it is by comparison that we learn much, a contrast of conditions and sentiment now prevailing with the corresponding time last year discloses a marked difference, which, as every one is aware, is of a distinctly favorable character. And not only do the iron trade and the interests identified with it recognize this improvement as existing, but it is confidently expected that with the signing of the tariff bill and the further harvesting of the crops and increased earnings of the railroads (thus enabling this great interest to enter the market to a greater extent as a buyer of iron products) there will be in evidence a purchasing power which will tax the capacity of the various manufacturing plants to satisfy with reasonable promptness. There is also a quite general belief in the hardening, if not further advance, of prices of some staples.

Coke.—The market for coke is ruling a little stronger, without, however, a marked improvement in the demand. Some of the brokers report a slight advance in price. The demand is for small lots, since the largest sale reported was 300 tons, though all of them mention a fair inquiry, coming, for the most part, from outside sources. The market may be quoted as follows for 72-hr. standard Connellsville: For prompt shipment or delivery over the balance of the year, $2.25 at oven; for shipment over one year, $2.35; for first half 1910, $2.50 is asked. Most of the inquiry is for shipment over the remainder of 1909.

Pig Iron.—Inquiry among the leading sales agencies develops that there is practically no $12.50 No. 2 Southern foundry on the market. In fact, the asking prices are now $13 for spot and $13.50 for shipment over the balance of the year. Under present conditions, in view of the extent of the recent advance, offers of previous prices would be submitted to such furnaces as might be supposed to be willing to entertain them. On the other hand, several furnaces have either withdrawn from the market or have advanced to figures above current prices. A fair statement of the situation would require reporting the market as unsettled, with producers still inclined to demand a further advance for round lots for far forward delivery. A growing disposition to enter the market speculatively is manifest on the part of houses which operate for their own account. Among the sales reported at the close of the week was one by De Camp Bros. & Yule Coal, Coke & Iron Company of 6000 tons car wheel iron to a local foundry, delivery as follows: 2000 tons August, 2000 tons September and 2000 tons October. Inquiries are principally coming from the country and cover a wide range of territory reaching even to the coast, ranging from 100 to 500 tons, some of which are resulting in sales. The local demand is quiet. Not much demand is reported from stove manufacturers, though they are liable to come in ere long, since they are merely awaiting reports from their road salesmen. In quoting the market we name $13.50 as the asking price for No. 2 Southern foundry, Birmingham, for shipment over the fourth quarter, with the possibility of firm offers of $13 being accepted.

Lead, Spelter, Etc.—Lead is quotable at 4.20c., East St. Louis; market dull. Spelter is held at 5.37½c.; demand active and coming from consumers; also strong at Joplin. Zinc ore is $44.50 per ton, Joplin base. Tin is ¼c. lower; antimony unchanged; copper unchanged. For finished metals the general inquiry is fair; improvement steadily going on and a far better demand than last summer.

Old Materials.—Following the appreciation in the pig iron market, together with a decidedly greater interest being manifested on the part of the mills, through an improved demand for their products, the ideas of dealers are reflected in a quite general advance in their asking prices, covering nearly the entire list. In case of the leading dealers, a good business is doing, though they are not, by any means, anxious sellers. There were, at the close, no railroad lists out. The large list closed out by the Mobile & Ohio early in the week realized top prices at the time of sale. Noting an advancing tendency, we quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	14.50 to 15.00
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	16.00 to 16.50
Heavy melting steel scrap	14.50 to 15.00
Frogs, switches and guards, cut apart	14.50 to 15.00

The following quotations are per net ton:

Iron fish plates	$13.25 to $14.25
Iron car axles	19.00 to 19.50
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.00 to 13.50
Railway springs	13.00 to 13.50
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	6.50 to 7.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	12.50 to 13.00
Agricultural malleable	11.50 to 12.00
Pipes and flues	10.00 to 10.50
Railroad sheet scrap	8.50 to 9.00
Railroad grate bars	10.00 to 10.50
Machine shop turnings	8.00 to 8.50

The Missouri, Kansas & Texas Railway has recently acquired a large block of land at North St. Louis, which, it is understood, will be used as a site for a passenger and freight depot for the purpose of establishing independent terminals here. The price paid for the land is said to have aggregated over $500,000. This is in addition to other considerable purchases of land by the company in the same neighborhood within a few months.

The Missouri Valley Bridge & Iron Company, Leavenworth, Kan., was the successful bidder for the contract to build the piers for the new Municipal Bridge to span the Mississippi River at St. Louis. Its bid was $459,835.63. A bond for $125,000 is required by the terms of the contract, to be filed within 10 days. Boller & Hodge, New York City, are the engineers for the plans and building of the bridge.

Cincinnati.

CINCINNATI, OHIO, August 4, 1909.—(*By Telegraph.*)

This week's iron and steel markets show a reflection of the strong impulse that has been dominating those of the East, and every line is stronger. Competition in finished products, such as bars, structural shapes and sheets, is visibly less keen, because the large and small makers have within the past few days firmed up on prices, all now being more closely bunched in the race for business. In the machine tool markets every mail brings evidence of increased confidence in the future, and some splendid sales are under negotiation. Coke, the index which accurately gauges the melt of iron, is being received in larger shipments, and requests for hold-up are very few.

Pig Iron.—This week finds the sales agents more nearly of one mind on the market prices of iron and the indications of a speculative trend are rather less in evidence. Southern iron is firm at $13, Birmingham, for August and September delivery, and $13.50 is asked for the fourth quarter. While one Southern interest was in evidence last week for first quarter business at $13.50, Birmingham, the price has since been withdrawn, and so far as can be learned no Southern furnaceman has opened his books definitely to business for next year, save at what would now be termed prohibitive prices. Northern iron is still quotable at $15, Ironton, for No. 2, for the remainder of the year, and $15.50 can be done for the first part of the year. Consumers seem to have been temporarily scared off by the developments of the past two weeks, for there are few orders being booked at the quoted prices. Standard Southern forge is still scarce and it is believed that this grade will easily bring $11.75 to $12, Birmingham. The steel maker in central territory who wanted 2000 tons of basic last week bought Northern at about $16, delivered. An Indiana manufacturer of lawn mowers is asking for prices on 150 tons of Northern iron; a large Wisconsin manufacturer of electric equipment wants 1000 tons of Southern iron for August, September and October delivery; an Ohio stove maker wants 100 tons per month of Southern high silicon iron for balance of the year; a large sewing machine manufacturer in central territory is buying some high silicon iron. The largest pipe interest is said to be buying quietly all through this territory. The large tool manufacturing concern which was in the market last week for 500 tons of Southern iron rejects $13 quotations and is said to have got in on the last of the $12.50 business. So many of the Southern furnaces are out of the market and refusing to quote on business that the situation is not a little puzzling, a number of consumers contending that the present is a fictitious and unhealthy market. There is no question, however, that the melt is increasing daily and all agencies are having a fair run of spot business in small lots for immediate shipment. For August and September delivery, based on freight rates of $3.25 from Birmingham and $1.20 from the Hanging Rock District, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$16.75
Southern coke, No. 2 foundry	16.25
Southern coke, No. 3 foundry	15.75
Southern coke, No. 4 foundry	$15.25 to 15.50
Southern coke, No. 1 soft	16.75
Southern coke, No. 2 soft	16.25
Southern coke, gray forge	15.00 to 15.25
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	16.70
Lake Superior coke, No. 2	16.20
Lake Superior coke, No. 3	15.70
Standard Southern car wheel	22.25 to 23.75
Lake Superior car wheel	20.50 to 21.00

(*By Mail.*)

Coke.—A slight increase in specifications on foundry coke is noted. Sales are made on the basis of $2 to $2.25, at oven, on Connellsville, Wise County and other standard brands. There is some inquiry for furnace coke from an Alabama iron maker, and the price ranges from $1.75 to $1.85, at oven, with a still lower price on small spot lots. Some furnace coke from the lower Connellsville regions is quoted at $1.54 and some a shade lower.

Sheets.—Business in sheets is improving rapidly and a stiffening in prices is noted all along the line. The demand for roofing sheets is particularly good. Cards have just been issued by the Newport Rolling Mill Company withdrawing quoted prices, and that interest announces an advance on black and galvanized sheets of $2 per ton and on painted and galvanized roofing sheets of 10c. per square. This announcement follows an advance of $2 per ton on sheet bars and billets by the Andrews Steel Company, from which the rolling mills secure their supply.

Bars.—It is believed that there is comparatively little shading in this market of the quoted price of 1.35c., Pittsburgh, on steel bars. Little if any contracting is being done by any of the independent interests, and the salesmen are as a rule off on their vacations. It is expected that by September the sales departments will be busy with 1910 business. Iron bars are distinctly stronger and the smaller independent interests are delivering bars on the basis of 1.40c. and 1.45c., Cincinnati.

Structural Material.—All lines of structural material are strong and the price is now rather uniformly 1.40c., Pittsburgh, by all interests. Representatives of large independent interests here predict a return to 1.50c., Pittsburghs, on shapes before the close of the year. No new lettings are announced here.

Old Material.—All lines of scrap are stronger, with a 25c. advance to be noted in certain items. Select railroad wrought has been in good demand and some good sized tonnages have been moved since our last report. Stove cast scrap has also been in evidence; 1000 tons reported sold by a local interest, largely to Southern melters, at about $9.50, Cincinnati. Melting steel has also sold well. Dealers' prices to the trade, f.o.b. Cincinnati, are about as follows:

No. 1 R. R. wrought, net ton	$14.00 to $14.50
Cast borings, net ton	6.25 to 6.75
Heavy melting steel scrap, gross ton	13.50 to 14.00
Steel turnings, net ton	8.00 to 8.50
No. 1 cast scrap, net ton	13.75 to 14.25
Burnt scrap, net ton	9.50 to 10.00
Old iron axles, net ton	18.25 to 18.75
Old iron rails, gross ton	15.25 to 15.75
Old steel rails, short, gross ton	13.75 to 14.25
Old steel rails, long, gross ton	14.75 to 15.25
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	14.50 to 15.00
Low phosphorus scrap, gross ton	13.50 to 14.00

John Daker, Jr., for some time salesman for the Domhoff & Joyce Company, has returned to Hickman, Williams & Co., with whom he had previously been connected for several years, and will travel from the Cincinnati office.

San Francisco.

SAN FRANCISCO, July 28, 1909.

The recent advance in mill prices on several lines of finished products has not been followed by any corresponding advance by the San Francisco jobbers, who are still selling most descriptions of rolled products at about the same figures as prevailed two months or more ago, while wrought pipe is offered in some cases below the present cost. This condition is not apparently caused by any underlying condition of the market, but is ascribed to rivalry between some of the local interests, as the tonnage moving is fully as large as at any time during the past year, and none of the jobbers are carrying any burdensome stocks. The demand continues strong in all lines, the month as a whole showing a slightly greater movement than June. In view of advancing mill prices, many small consumers are taking advantage of the demoralized local market to purchase for future requirements. Pacific Coast manufacturing interests note a material increase of business, and there is considerable marine work under way both here and on Puget Sound. Several important machinery orders have been booked recently, among them a large order for machine tools for the Western Pacific shops at Oakland and Oroville, placed with Harron, Rickard & McCone. It is no longer possible for jobbing and manufacturing interests on the Coast to look for prompt deliveries of rolled products, and the conservative policy in regard to purchases which they have followed for the last year is gradually being abandoned.

Structural Material.—The tonnage of structural shapes ordered for San Francisco has increased materially in the last month, and a number of new contracts have been closed for fabricated material, though the majority of the jobs have been comparatively small. Much of the less important work is taken by local fabricators, though the largest shop in the city is now well filled up, with a number of large contracts taken earlier in the summer. Prices on fabricated work show gradually increasing firmness. The American Bridge Company has just taken a contract for 100 tons for a bridge in Shasta County, Cal. The Pacific Rolling Mill Company has taken the contract for the Mysell-Rollins Building on Clay street. There is a notable increase in the amount of structural work in immediate prospect, which includes a number of large buildings. Several of them, including the Children's Hospital and the St. Francis Hospital, are likely to come up within the next week or two, though a number of large jobs may be held back for some time. It is reported that plans for the new Hearst Building have been completed and placed in the hands of Mahoney Brothers of this city, who will shortly let contracts for the material. A large steel contract is also coming up shortly at Tacoma, Wash., where plans have been made for a 20-story building. The Home Telephone Company is planning to erect a large steel frame building on Market street. A moderate tonnage of reinforcing material has been ordered for the Hall of Records at Yreka, Cal., and a large quantity will be required within the next few months for buildings on the San Francisco waterfront, including the ferry station for the Western Pacific. A four-story steel frame building is soon to be erected on Kearny street, near Post. A project has been started to erect an eight-story Class A apartment house at Van Ness avenue and Sacramento street, covering a lot 127 x 204 ft., and plans are being prepared for a 10-story building at California and Pattery streets. It is announced that the Southern Pacific will erect its steel bridge at Sacramento before the first of the year. The Seattle Electric Company is planning a large structure at Seattle, Wash. The lowest bidder

on structural steel for the new court house at Portland, Ore., was the Northwest Steel Company. The work will require 600 tons, delivery to be completed within 90 days.

Wire and Wire Products.—A fair tonnage of wire and wire products has been booked on the Pacific Coast in the last month, though the movement at present is smaller than during the spring. Prices have advanced $2 per ton within the last week.

Rails.—The demand for light rails continues very active and the movement of the last two months has been considerably larger than for the corresponding period last year. Considerable development work is now being carried out by the mining interests, which are among the largest purchasers of this material, and the outlook is for a continued steady demand. In heavy rails individual orders are not of large proportions, but with numerous small transactions the tonnage is considerably heavier than a few months ago. New grooved rails are being laid on several miles of street railroad by the United Railroads and the California Street Railway Company. Some of the larger interurban projects in California appear to be held up indefinitely, owing to litigation and loss of franchises. The Hilo Railroad Company of Honolulu, has authorized a bond issue for a 15-mile extension of its line.

Pig Iron.—Arrivals of foreign iron at San Francisco recently have been small, though a shipment of 1000 tons has arrived at Portland, Ore. The local market shows no material change, prices standing about as before, and supplies remain considerably in excess of requirements. While the tonnage of cast iron work continues to show a gradual increase, very few melters are operating at anything like their capacity, and are buying only in small lots for immediate requirements.

Cast Iron Pipe.—No large transactions have been closed recently, though moderate inquiries are still coming up in different parts of the Coast. The San Francisco pipe is coming forward rapidly, but the installation has not commenced. The city will shortly be in the market for a large lot of special work in connection with the new system. New water works projects elsewhere on the Coast are progressing slowly, but several large orders may be placed at any time and preliminary work is being done on a number of proposed systems. The number of inquiries for the renewal and extension of existing systems indicates a heavy tonnage within the next year or two, with a possibility of a larger movement during the coming fall. The town of Anaheim, Cal., is in the market for a small tonnage. The city of Alameda is preparing to lay a 10-in. main for fire protection in the business district, following the offer of the Dow Pumping Engine Company to furnish the machinery. The town of Modesto, Cal., will receive bids August 11 for 16,000 ft. of 4-in. pipe and 2000 ft. of 6-in. pipe. The town of Colusa, Cal., is planning to lay a lot of pipe in the near future. Portland, Ore., is preparing to add a number of extensions to its cast iron system. Carson City, Nev., is in the market for 5700 ft. of 8-in. pipe.

Merchant Pipe.—The jobbing business in merchant pipe is rather unevenly distributed at present, as some merchants whose stocks are depleted now refuse to meet the prices named by others. Quotations are very irregular, but advancing prices in the East are expected to force up the local values in the near future. The movement continues on about the same scale as before, though transactions with the oil fields have been on a rather larger scale than early in the month and considerable new tonnage is in prospect in that quarter. The demand on the part of local merchants also shows some increase, owing to the difficulty of getting prompt deliveries. Vancouver, British Columbia, is in the market for a large lot of steel pipe.

Old Material.—The scrap market shows considerable improvement and prices are firmer, particularly on cast iron and steel melting scrap. The old scrap iron from the City Hall has been disposed of, and local dealers who have been holding a large quantity of heavy machinery scrap at $18 per ton are now moving the accumulation at full prices. The outlook is for continued firmness, as there is considerable foundry work in sight for which this material is available. The present activity has been largely brought about by the call for bids on 154 tons of cast steel specials for the auxiliary water system and a prospective requirement of about 2300 tons next month.

Four armored cruisers are to be dry docked at the plant of the Union Iron Works next month.

The American Steel & Wire Company has started work on a large steel and concrete warehouse and distributing plant at Fourth avenue and Connecticut street, Seattle, Wash. The building will be five stories high and the estimated cost is $300,000.

It is announced that the Southern Pacific has finally determined upon the purchase of steel cars for its suburban system and that the contracts will shortly be let.

The Pacific Lumber Company of this city has purchased a 15-ton wrecking engine from the American Hoisting & Dredging Company, and has installed 10 72-in. boilers and two Corliss engines in its new mill at Eureka, Cal.

Harron, Rickard & McCone will move September 1 to their new building at 127-139 Townsend street. The structure is five stories high, with an area of 96 x 125 ft. In the new quarters they will carry a full line of transmission equipment manufactured by the Dodge Mfg. Company. Mr. Rickard of this firm says in regard to the Pacific Coast machinery market: "Business is rather spasmodic, but the volume of late has been about 95 per cent. of the normal. The cost of transacting business, however, is greater, and competition is keener than in 1905, which we consider a normal year."

The San Francisco department of the Crane Company will move into its six-story building at Second and Brannan streets about September 1.

The Judson Mfg. Company's plant at Emeryville, Cal., is still closed for repairs and inventory. An amicable agreement has been made with the workmen, the previous agreement having expired the first of the month.

It is reported from Tacoma, Wash., that the Pioneer Steel Company is preparing to install a subsidiary plant at Prince Rupert, B. C.

The Puget Sound Iron & Steel Works of Tacoma, Wash., has completed plans for a marine railway and shipyard.

F. L. Patton of the Sheffield Cast Iron Pipe & Foundry Company has been in Seattle, Wash., recently and it is rumored that he is considering the feasibility of locating a cast iron pipe foundry in that city.

Buffalo.

BUFFALO, N. Y., August 2, 1909.

Pig Iron.—The striking feature of the market is the upward trend of prices in the midst of the midsummer season, usually characterized by a lull in buying. Consumption is now rapidly overtaking production and furnacemen find the condition of their order books warrants a further advance. Most grades have risen approximately 50c. per ton during the week. The run of new business is in fairly good volume and shipments on contracts from furnaces in this district are exceedingly heavy. Many consumers are increasing their specifications owing to the fact that their melting requirements are exceeding their original estimates. Foundries supplying the railroad trade are ordering more freely. We quote as follows for current and fourth quarter deliveries, f.o.b. Buffalo:

No. 1 X	$16.00 to $16.50
No. 2 X	15.75 to 16.25
No. 2 plain	15.25 to 15.75
No. 3 foundry	15.00 to 15.25
Gray forge	14.75 to 15.00
Malleable Bessemer	15.50 to 16.00
Basic	16.00 to 16.50
Charcoal	19.50 to 20.00

Finished Iron and Steel.—The market is strong, with specifications on contracts coming in freely and good tonnages of new business being received, principally in bar material, although some interests report a little lull in active buying. One of the independent interests has advanced the price of steel bars to 1.35c., Pittsburgh. Some of the local interests are obliged to decline orders for bar material, owing to the congested condition of their merchant bar mills, and are only promising deliveries for extended dates. Sales for July in all lines of finished products were very heavy, all local mills and agencies reporting aggregate tonnages booked largely in excess of total volume of shipments, and the leading interest reports that the total sales of the local office for the first six months of 1909 exceed the total sales for the entire preceding year. The demand for structural material continues active. Some fabricators and contractors find it difficult to obtain steel in the specified time for structures they have in process of erection and are obliged to piece out their requirements for some of the smaller contracts by obtaining a portion of the material for one building from different mills in order to secure quicker delivery and not delay construction. The George Kellogg Structural Company has received contract for the steel for the E. R. Thomas Motor Company's factory addition.

Old Material.—The market is very firm, although there has been no large amount of buying by consumers recently. Dealers are looking for more active buying in the near future and are holding stocks for the expected larger demand and advance in price. There has been practically no change in prices since last week's report. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel scrap	$15.00 to $15.50
Low phosphorus steel scrap	18.50 to 19.00
No. 1 railroad wrought	16.00 to 16.25
No. 1 railroad and machinery cast scrap	14.75 to 15.00
Old steel axles	19.00 to 19.50
Old iron axles	21.75 to 22.00
Old car wheels	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Boiler plate	12.75 to 13.25
Locomotive grate bars	12.00 to 12.50
Pipe	12.25 to 12.75
Wrought iron and soft steel turnings	9.00 to 9.50
Clean cast iron borings	7.50 to 8.00
No. 1 busheling scrap	13.00 to 13.50

The German Iron Market.

BERLIN, July 23, 1909.

The condition of business with the steel mills is not without some better features in certain sections of the trade, but in no department has there been any improvement whatever in prices. The Steel Syndicate has decided to maintain prices unchanged for the new quarter. The prices for steel material are as follows: 82.50 marks for ingots, 95 for blooms and 102 for billets. After the decision to maintain prices was made known consumers began to place orders for the quarter's supplies, and these have been coming in at about the rate that has prevailed during the present depression of business. The syndicate's shipments for June were about 29,000 tons above those for May. The gain was almost wholly in railroad supplies, but structural shapes increased 10,000 tons. Billets showed a shrinkage of 4000 tons.

In the usual monthly résumé of the situation given out by the syndicate recently it is mentioned that, in the foreign markets, a better demand for heavy rails is unmistakable, and that a number of rather large orders had been taken. It is understood that these were chiefly of South American origin. It further reports that the home business in grooved rails is satisfactory, while rails for mines are in better demand, particularly for export. A slight improvement in structural shapes is mentioned, and specifications are coming in at a satisfactory pace. In the English market the competition of the domestic works in structural shapes is very sharp, but in some other European countries the demand for beams has been considerably better.

Private reports on this section of the market are less cheerful than that of the syndicate. It is emphasized by so trustworthy a newspaper as the Cologne *Gazette* that the point of great weakness is the lack of orders in heavy rails, which is due in the main to the lightness of the amount taken by the railroad authorities of the various German states. It also says that in the structural section orders for heavy beams are few.

In some other sections of the steel trade business appears to be somewhat better. Some of the great mixed concerns report that specifications have been coming in more briskly for bars and lighter sheets for several weeks. It is mentioned as a mark of unusual activity with some works that they stipulate six to eight weeks for filling new orders. Somewhat better business is also reported in heavy plates, with the exception of boiler plates.

Notwithstanding the better business with a few of the big mixed works, however, the fact is not denied that the general state of business with steel mills is bad. Not long ago one mill of considerable size was shut down in Lorraine for lack of work. It reported that it had not had such a dearth of orders for above a decade.

Some sections of the hardware trade have had better business, but the improvement has nowhere been marked, and in all sections of the trade complaints of low prices are heard. The export business with the United States, which had improved considerably several months ago because of the fear of higher duties, has dropped off to a considerable extent. American buyers apparently estimated that further orders could not be filled before the new tariff law is enacted, and left off sending over for more goods in order not to get caught by the Payne rates. It is feared that the export trade with the United States will suffer a permanent restriction.

In sections of the hardware trade business is still so unsatisfactory that the shops are compelled to limit production, some by shutting down for several days in the week, others by shortening the hours worked daily. In the small arms industry at Solingen there is little doing, orders having been greatly reduced since the various war scares blew over. There is not much activity in agricultural hardware, the farming season being backward by reason of unfavorable weather conditions. In builders' hardware the shops have been disappointed in the realization of their hopes; building activity is still everywhere at a low ebb, and no improvement is to be expected any more this year. In this section of the trade there is also considerable demoralization in prices, owing to the breakdown of several trade organizations. In rivets and screws business is slightly better, but prices are so low that business can hardly be done with profit. In machine tools also prices are unsatisfactory, but business has picked up a little.

The Carnegie Steel Company has started up its third Isabella stack and now has in blast 51 out of the total of 59 blast furnaces owned. The idle stacks are two Columbus, Edith, Neville Island, one Duquesne, Steubenville, Niles and Zanesville.

James T. Sarratt of Steubenville, Ohio, has bought the light rail plant formerly operated by the Ohio Rail Company, at Newark, Ohio.

New York.

NEW YORK, August 4, 1909.

Pig Iron.—The principal feature of the market during the past week has been the disposition among an increasing number of sellers of Northern iron to advance their quotations. The higher prices are not yet quite general, but the tendency is decidedly in that direction. On business for 1910 delivery sellers are holding off entirely. We quote No. 1 foundry at $17 to $17.25, No. 2 foundry at $16.75 to $17, and No. 2 plain at $16 to $16.50, with little iron available at the lower figures. Alabama iron is quoted at $17.75 to $18 for No. 1 foundry and $17.25 to $17.50 for No. 2 foundry.

Steel Rails.—Additional requirements of several roads are the chief factor of interest in the rail market. The Baltimore & Ohio is expected to take 20,000 to 25,000 tons more and the Harriman lines have bought 5000 tons in the Chicago District in addition to their original purchases, which totaled 130,000 tons. The Pennsylvania Railroad is also expected to take a further amount.

Structural Material.—The recent New York contracts for steel buildings have been largely secured by one important contracting interest and comment is again directed to the fact that fabricating companies have not been bidding in line with the advances in plain material. Current prices for fabrication are some distance from an alignment with 1.40c., Pittsburgh, for plain material. Locally the principal business of the week consists of three buildings aggregating 5000 tons—the Coleman loft building on fifty-second street, 2000 tons, the Merchants' Realty Company Building on Forty-fifth street, 1000 tons, taken by the American Bridge Company, and an office building on Forty-second street, taken by Milliken Brothers. The bids for a steel highway bridge at Waterford, N. Y., to replace the burned wooden bridge of the Union Bridge Company go in to-day. For the Cape Cod Canal two Scherzer lift bridges are being considered, one spanning the canal and the other a railroad alongside. The Philadelphia & Reading has let 700 tons of bridges on its Perkiomen branch, the business being divided among three companies. The usual minimum quotation on plain material is now 1.40c., Pittsburgh, or 1.56c., tidewater delivery, on shipments from mill.

Ferroalloys.—Some good business has been done in ferromanganese and some sellers are quoting $42.50, but sales have been reported at $42. Ferros.licon is in good demand and not very plentiful. We quote from $63 to $65, New York, duty not guaranteed.

Bars.—Transactions have not been numerous nor have the quantities involved been large. Nevertheless prices are firm, at 1.50c. to 1.55c., tidewater, for bar iron, and 1.46c. to 1.51c., tidewater, for steel bars.

Cast Iron Pipe.—This branch of trade appears to be practically alone in showing little or no response to the quickening effects of the improvement in general business and the advancing prices on raw materials. Only small lots are being purchased, and these are mainly for extensions to old operations. Carload lots of 6-in. are quoted at $23 to $23.50 per net ton, tidewater.

Old Materials.—While a good demand is experienced for all grades, steel scrap has been the most active item in the list. Fair sales are reported of rolling mill stock, while the foundry demand is showing further improvement. Some inquiries are in the market for old car wheels. Malleable iron scrap is unusually scarce and exceedingly strong. Some disquiet is occasioned in the trade by the report that the steel works in eastern Pennsylvania have made arrangements through a single agency for the purchase of all the steel scrap required by them for the remainder of the year. The reduction from $4 to $1 per ton in the duty on scrap iron and steel in the new tariff is exciting considerable discussion, but opinions differ with regard to the effect it will have on the scrap trade. It is known that considerable quantities are in position to be shipped at an early day from Canadian ports, taking a low water rate to points on our seaboard. It is also believed that quite large quantities will soon be found ready for shipment from points in Central and South America. Seaboard dealers are therefore inclined to believe that prices may be kept down by importation whenever conditions are favorable for shipping the material to this country. Quotations are as follows, per gross ton, for delivery in New York and vicinity:

Old girder and T-rails for melting	$13.50 to $14.00
Heavy melting steel scrap	13.50 to 14.00
Relaying rails	21.00 to 21.50
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	18.50 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Iron track scrap	14.50 to 15.00
No. 1 yard wrought, long	14.00 to 14.50
No. 1 yard wrought, short	13.00 to 13.50
Light iron	8.00 to 8.50
Cast borings	8.50 to 9.00
Wrought turnings	10.00 to 10.50
Wrought pipe	12.00 to 12.50
Old car wheels	14.50 to 15.00
No. 1 heavy cast, broken up	13.50 to 14.00
Stove plate	11.50 to 12.00
Locomotive grate bars	11.50 to 12.00
Malleable cast	14.75 to 15.25

Metal Market.

NEW YORK, August 4, 1909.

Copper.—The most interesting event of the week in the copper market was the trading in standard copper on the New York Metal Exchange which was begun on Monday, and those who attended at the opening call saw a larger assemblage than has been at the exchange in some years. On that day 225 tons of copper were sold, and while there were some rumors of wash sales, it was declared by a number of brokers that they had been commissioned by consumers to make purchases. Spot copper was offered at 12.75c., while 12.50c. was bid, and copper for December delivery was offered for 13.40c. and 13.17½c. was bid, with 13.27½c. as the settling price. On Tuesday the sales amounted to 75 tons, and the majority of the transactions on that day were made by brokers who bought for consumers. Those who have had little faith in the new movement in the exchange seem willing to withhold judgment for a time, as the change received more encouragement than was anticipated in some quarters. The general tone of the copper market is encouraging and inquiries denote that there are many consumers who would be willing to come into the market for a good amount of electrolytic copper under 13c. Sellers as a rule are holding firm at that price, however, and in consequence it is a waiting market, with good prospects ahead. Some substantial inquiries are out for Lake copper and the trade in that grade has a firmer tone than existed at this time last week; while some small outside lots may be had at 13.37½c., we prefer to quote 13.50c., as there are some sellers who have refused offers at the former figure. The London market is more steady and it appears that a fair amount of copper has gone into consumption there of late, which has to a slight extent reduced the copper in storage. The total exports for the first seven months of the year show an increase of 815 tons compared with the same period of last year, and the exports of domestic copper from the Atlantic ports for the month of July amounted to 35,046 tons of 2240 lb. The total exports since January 1, 1909, exclusive of Southern and Pacific ports, for July, amounted to 182,526 tons, as against 181,711 tons for the same period in 1908. In London to-day spot copper brought £58 13s. 9d., and futures £59 12s. 6d. The sales were 400 tons of spot and 800 tons of futures.

Pig Tin.—While sales of pig tin for prompt delivery have been light, an excellent business has been done in futures, and the tin market has an upward trend that will prevail for some time, from all accounts. Better prices have been established than have been quoted for some weeks, and considering the fact that the monthly statistics were more encouraging than was looked for and that the price brought by the Banca sale of 2000 tons in Holland July 29 equaled 29.50c. laid down in New York the market is on a fairly firm basis. The report of the Banca sale had its effect here on Monday, when prices ranged from 29.40c. to 29.60c. The absence of quotations from London, where there was a holiday on that day, helped to send the figures up. Optimism was not so abundant on Tuesday, however, and while the London market responded in a measure it advanced only 10 shillings, and sellers here graded their prices down to 29.50c. at the close. With the keen edge off the market, it opened fairly firm to-day and sellers hope to hold it around 29.50c. at least. Prices established during the week were:

	Cents.
July 29	29.30
July 30	29.35
August 2	29.60
August 3	29.50

In London to-day spot tin brought £133 7s. 6d. and futures £134 17s. 6d. The sales were 250 tons of spot and 350 tons of futures.

Figures compiled by C. Mayer, of the New York Metal Exchange, showed that the combined deliveries of London and Holland for July were 254 tons larger than last year. For the seven months the decrease in deliveries amounts to 302 tons, compared with the same time last year. Shipments from the Straits for July were 1023 tons larger than for the same month of last year. For the seven months of this year the decrease in shipments has been 1222 tons, compared with the same time last year. Australia shipped 130 tons more in July compared with the same month of last year. For the seven months of this year the shipments were 280 tons smaller compared with the same time last year. The total visible supply on July 31, 1909, was 4282 tons above that of July 31, 1908.

Lead.—While the lead market is dull, most of the resales have been taken up, and it is more difficult to buy outside lots under the price quoted by the American Smelting & Refining Company, which is 4.35c. There have been reports of a few sales here at 4.32½c., but some consumers who were offering lead have withdrawn from the market in preference to selling at that price. The St. Louis market is reported to be firmer and some interesting transactions were made at the Metal Exchange during the week under the new trade rules. The sales at the Metal Exchange up to yesterday amounted to 25 tons of lead, and the settling price for September delivery was 4.35c. and for October delivery 4.37½c.

Spelter.—There is a better demand for spelter and the price has advanced rather sharply in response. Some excellent sales have been reported, but most of the transactions have been in small lots. Sellers are asking 5.60c., New York, and the prevailing price in the St. Louis market is 5.45c. Some sellers who did not anticipate the upward movement early in the week were offering the metal here at from 4.45c. to 5.50c., but to-day most of them are holding it firm at 5.60c.

Antimony.—The market is quiet and prices are unchanged, with Cookson's at 8.25c. and Hallett's at 7.50c.

Tin Plate.—In keeping with the general upward trend of the metal market there has been an increased demand for tin plate, but not enough to cause any great raid on the stock in storage, and sellers continue to hold it at the price at which it prevailed for the last few weeks. We quote for 100-lb. I C coke plates $3.64.

Old Metals.—The following dealers' buying prices represent the New York market:

	Cents.
Copper, heavy cut and crucible	11.00 to 11.25
Copper, heavy and wire	10.75 to 11.00
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.50 to 10.00
Clean brass turnings	6.75 to 7.00
Composition turnings	7.75 to 8.00
Lead, heavy	3.50
Lead, tea	3.25
Zinc scrap	3.25

Sheet Zinc.—The ruling price of sheet zinc has advanced to $7.25 per 100 lb. basis, less 8 per cent. discount at smelter.

Nickel.—There is such a good demand for nickel that many would not be surprised to see the market advance shortly, although 45c. seems to be the prevailing price at present for large lots.

Aluminum.—Electrical manufacturing interests are buying aluminum quite heavily just now and the general price for No. 1 melting ingots is 24c.

Iron and Industrial Stocks.

NEW YORK, August 4, 1909.

The past week has been attended with some excitement in iron and industrial stocks. United States Steel common attained a new high record, while the railroad equipment stocks were all strong, some of them likewise selling at record prices. The whole list moved upward as a result of improving conditions in general trade and particularly on account of the brilliant showing made by railroad earnings. It is expected quite confidently that the railroads will be more liberal purchasers of iron and steel products, cars, locomotives, &c., during the fall months. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	15¼- 16⅞	Pressed St., pref...	107¼-110
Allis-Chalm., pref..	53¼- 57⅜	Railway Spr., com.	46½- 52½
Beth. Steel, com...	30 - 34¼	Railway Spr., pref.	105⅞-108½
Beth. Steel, pref...	60⅞- 66	Republic, com.....	36⅞- 37½
Can, com.....	11⅞- 13¼	Republic, pref.....	109¼-110⅝
Can, pref.....	82⅛- 84½	South. I. & S., com.	19½- 21½
Car & Fdry, com...	62⅝- 70	South. I. & S., pref.	56⅜- 58
Car & Fdry, pref...	119¼-124¾	Sloss, com.....	83⅞- 86½
Steel Foundries...	54¾- 59	Sloss, pref.....	119
Colorado Fuel.....	45¾- 48⅜	Pipe, com.....	32 - 34¾
General Electric...	168¼-172	Pipe, pref.....	83 - 85
Gr. N. ore cert....	75¼- 78⅝	U. S. Steel, com...	70⅞- 75¼
Int. Harv., com...	87¼- 89¾	U. S. Steel, pref...	127 -129¼
Int. Harv., pref.....	122	Westinghouse Elec.	84½- 86⅞
Int. Pump.....	39¼- 41	Chi. Pneu. Tool...	23 - 24
Int. Pump, pref....	87 - 88¾	Am. Ship, com.....	63 - 67¼
Locomotive, com...	62⅝- 67¾	Cambria Steel.....	*43½- 43¾
Locomotive, pref...	120 -120¾	Lake Sup. Corp...	25¼- 27
Nat. En. & St.,com.	15¾- 17½	Warwick	9
Nat. En. & St., pref.....	90	Crucible St., com..	12½- 14½
Pressed St., com...	46½- 56	Crucible St., pref..	79⅝- 82

* Ex dividend.

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 75¾, preferred 129; Car & Foundry common 70⅛, preferred 124¾; Locomotive common 69, preferred 122; Steel Foundries 60¾; Colorado Fuel 47½; Pressed Steel common 55, preferred 108¾; Railway Spring common 53½; Republic common 36½, preferred 107; Sloss-Sheffield common 85¾; Cast Iron Pipe common 34, preferred 85; Can common 12¾, preferred 84¼; Bethlehem common 33½, preferred 65½.

A special meeting of the stockholders of the Henry R. Worthington Company is to be held August 7 to authorize an issue of 20-year 5 per cent. debentures for funding the indebtedness of the company to the International Steam Pump Company and for other corporate purposes. This indebtedness amounts to about $2,000,000. There will be no public offering of the Worthington Company bonds.

Dividends.—The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 25.

The Progress of Tariff Revision.

WASHINGTON, D. C., August 3, 1909.—The Conference Committee, after three weeks spent in the consideration of the tariff bill, reached an agreement July 27, and the House after a single day's debate adopted the conference report at a late hour July 31. The report is now under consideration in the Senate, and in accordance with an agreement reached to-day will be voted upon on Thursday, the 5th inst., at 2 o'clock. A concurrent resolution reducing the duties on shoes will then be passed, after which the bill will be sent to the President for his signature, which will probably be affixed on Thursday or Friday, the new law going into force the following day.

The fight in conference to secure the elimination of the duty on iron ore and, failing in that, to reduce the rate below that of the Senate bill was long and bitter. It was led on behalf of the ore producers by Senators Burrows, of Michigan, one of the conferees, and Smith, of the same State. Had the President insisted on his original schedule of free raw materials, the duty would probably have been removed from iron ore, but the representations made to him by a delegation of ore producers and pig iron manufacturers who called upon him a week ago caused him to waver and the House conferees were induced to accept a compromise at the rate of 15 cents per ton.

The metal schedule as finally adopted by the conference committee is regarded in both House and Senate as one of the most satisfactory features of the bill. The heaviest reductions in the entire bill were incorporated in this schedule by the Ways and Means Committee, and the Finance Committee not only accepted the bulk of the cuts made by the House but actually reduced a number of items still further. Mr. Payne himself is authority for the statement that the schedule as finally agreed to contains but three items of any importance as to which the rates are above those of the Dingley act. One of these items is structural steel, upon which the House levied a duty of three-tenths of one cent per pound. The Senate divided this class of steel in three grades—unfinished, valued at $18 per ton or less, which was left at the House rate; unfinished, valued at more than $18 per ton, which was raised to four-tenths of one cent per pound; and finished, including punching, assembling, &c., which was transferred to the basket clause of the metal schedule at 45 per cent. ad valorem. In explaining the reasons which moved the House conferees to agree to these increases Mr. Payne said: "I was surprised to learn, after I became a conferee, that the fabrication is done in another shop and is a distinct industry from the rolling, hammering or forging."

The second item of importance upon which, according to Mr. Payne, the conferees increased the rates of the Dingley act was high-speed tool steel, which was justified on the ground of its cost of production and its comparative novelty. The third item embraced nippers and pliers, dutiable under the Dingley act as 45 per cent. ad valorem, but which the Conference Committee provided for at the compound rate of 8 cents per pound and 40 cent. ad valorem.

Many inquiries have been received here concerning the taking effect of the prospective new tariff law and the treatment of goods that may be in customs bonded warehouse at the time or that may be in transit to the United States. The bill as agreed upon in conference provides that "on and after the day following the passage of this act" the new rates shall take effect; that is to say, if the bill is signed by the President on any given date it will go into force at midnight on that date and will govern all transactions thereafter. Should the President sign the bill on any day before the close of business withdrawals from customs custody on that date will be made under the terms of the Dingley act and not under the terms of the new law.

Regarding goods in customs custody at the time the new act goes into effect, it can be stated that the Treasury Department will assess duties thereon in accordance with the new rates without regard to whether the goods were actually imported before the taking effect of the law; in other words, the date of withdrawal rather than the date of importation will determine the rate of duty to be assessed. Concerning goods in transit at the time of the taking effect of the new law no special provision is made, but the Treasury Department officials will hold that they are dutiable the same as if they had not been shipped until after the taking effect of the new rates. Briefly stated, the ruling of the Treasury will be that the new law goes into force at midnight of the day on which the bill is signed by the President and applies to all merchandise withdrawn from customs custody thereafter, irrespective of the date of importation.

With a view to obviating any possible litigation concerning the application of the new duties to merchandise in bond when the law takes effect, the Conference Committee took from the Dingley act the exact section bearing on this subject. As it has been adjudicated as a part of the Dingley law, there can be no doubt as to its proper construction.

W. L. C.

Canada's Tin Plate Works Now a Sheet Plant.

It appears that the Sheet Steel Corporation, which some time ago erected a tin plate plant at Morrisburg, Ont., Canada, has found that it is impracticable to manufacture tin plate in Canada. President McComb of the corporation states in a local paper that it was found to be impossible and always will be impossible unless tariff protection is afforded. The company has remodeled its plant, and is now devoting itself exclusively to the manufacture of black sheets, for use in the stove industry and galvanized sheets for building purposes, in both of which a large and increasing demand is found. If the municipality will enlarge the public power plant to the capacity needed for supplying power to operate the company's enlarged works, it will build three additional mills, which will be ready for operation by September 1.

President McComb states that his company is just at the beginning of its developments. Its affairs have been planned for its extension into a great industry. He says that next year the company will erect two open hearth steel furnaces and manufacture its own steel bars instead of importing them from the United States. The enlargement of the municipal power plant will give sufficient power to operate the two open hearth furnaces, the bar mill, six hot mills and a small merchant mill for making rounds and squares.

The Western Drydock & Shipbuilding Company.—Officers of the American Shipbuilding Company, Cleveland, Ohio, have reached an agreement with the city officials of Port Arthur, Ont., as to terms for the building there of a large shipbuilding plant and drydock. The city has agreed to give the shipbuilding company 100 acres of land as a site and to pay a bonus of $25,000 a year for 10 years. The company will be exempt from taxes for 20 years with the exception of $2000 a year for school purposes. It will be necessary for the property owners to vote on the proposition and this they will do August 10. It is regarded as certain that they will approve the project. If the vote is favorable, work on the new plant will be started at once. It is the intention of the American Shipbuilding Company to build a complete shipbuilding plant and a drydock 700 ft. long, the entire plant to involve an expenditure of about $700,000. The plant will be operated under the name of the Western Drydock & Shipbuilding Company.

The strike of the puddlers in the rolling mills in the Pittsburgh District which sign the Sons of Vulcan scale is practically over. Brown & Co., Inc., Wheeling Steel & Iron Company, A. M. Byers & Co., Youngstown Sheet & Tube Company, Lockhart Iron & Steel Company and Zug Iron & Steel Company have signed. The only company in that district which has not yet signed is the Pittsburgh Forge & Iron Company.

The Machinery Trade.

NEW YORK, August 4, 1909.

The past week afforded an opportunity to more accurately gauge the demand for machine tools, as the extensive orders and inquiries of the two previous weeks which greatly swelled the volume of business were not duplicated nor were any of large proportion reported. Regardless of the fact that trade was made up almost entirely of small and medium sized business, practically all houses report a better demand and are much encouraged by the slow but steady expansion at this time of the year, when business generally falls off. The sources of inquiry are becoming greater and no one branch of business is now the mainstay of the market, as was the automobile industry some months ago, though that branch of trade is still an important factor and will be for some time to come. The railroads are doing very little buying, which is surprising in view of the few tools they purchased the past two years. Order books show a substantial increase in business booked during July in comparison with June; even those who did not share in the large business recently placed report a better month.

A number of machinery houses in this vicinity had some fair sized orders on their books from manufacturers in Spain previous to the outbreak of revolutionary troubles there and it was feared that they would lose the business. The New York representative of a prominent house which makes a specialty of exporting machinery, and especially machine tools, said yesterday in this connection that he had been directed by his principals in Barcelona to ship material ordered for that office at once, as there was no apprehension there that the trouble will continue long enough to make it unsafe to send the goods. He was also informed to forward machinery that had been ordered for other parts of Spain at once, and judging from this the business that was in sight from that country will materialize regardless of the political troubles.

Central of Georgia Railroad's Macon Shops.

Plans have been completed and contracts are being placed for the additional buildings that are to compose the new plant being erected at Macon, Ga., by the Central of Georgia Railroad at an estimated cost of $1,500,000. The American Bridge Company has been given contract for the structural steel. The car shop, repair tracks, power house, reservoir, high service tank with pumping station have been completed, and the engine terminal is well under way and should be finished by September 1. The principal buildings will be a machine shop, 70 x 510 ft.; erecting shop, 60 x 510 ft., with 22 erecting pits and with storage bay adjoining 45 x 510 ft.; tank and flue shop, 70 x 260 ft.; boiler shop, 60 x 260 ft.; brass foundry, 30 x 40 ft.; car repair shop, 195 x 300 ft., with two bays, each 45 x 300 ft.; power house with boiler room, 50 x 89 ft., and engine room, 50 x 89 ft.; blacksmith shop, 100 x 260 ft.; woodworking building, 50 x 160 ft.; oil house, 24 x 100 ft.; storehouse, 75 x 200 ft.; roundhouse and office building. There are to be a number of smaller structures and provision has been made for future expansion. Last week we published in these columns an extensive list of machine tools to be purchased for these shops through the purchasing agent of the Illinois Central Railroad at Chicago. It is understood that the tools on this list are required for the shops now nearing completion, and as many of the buildings have not yet been erected it is likely that considerable more machinery will be required to complete the equipment of the shops than that on the list.

A large plant, the equipment of which will necessitate the buying of considerable machinery, will be erected by the A. P. Smith Mfg. Company, Newark, N. J., in Bloomfield, N. J. The company, which at present has a plant at Passaic avenue, foot of Brill street, Newark, manufactures tapping machinery, valve fittings and general supplies for water works, and when the new plant is completed the manufacturing equipment in the existing plant will be moved there. The company's property in Bloomfield adjoins the factory of the Sprague Electric Company and its new plant will consist of six buildings, including iron and brass foundry, machine shop, pattern storage buildings, storeroom and office, and will cost approximately $135,000. The machine shop will be 100 x 155 ft. and the iron foundry 100 x 140 ft. Both of these structures will be one story and of steel construction. The brass foundry will be 50 x 120 ft. and two stories. The structure will be of concrete construction. The pattern storage building will be a brick structure, three stories and 45 x 90 ft. The storeroom will be 50 ft. square and the office building will be 40 x 50 ft. The buildings will be practically connected, forming three sides of a square. In addition to machine tool and foundry equipment to augment that in the company's existing plant a power plant, consisting of a 150-hp. boiler, 125-hp. engine and a 75-kw. electric generator, will be installed. The company will also purchase a 1000-gal. pumping equipment, an air compressor plant, two 10-ton traveling cranes and three additional cranes of a size not decided upon as yet. The plans for the structure were designed by Frederick A. Phelps, consulting engineer, who has offices in the Union Building, Newark, and the William Steele & Sons Company, Philadelphia, Pa., has the general contract. It is expected that the plant will be ready for occupancy by February 1 next.

The American Car & Foundry Company is to enlarge its Jackson & Sharp plant at Wilmington, Del., by the erection of a modern car erecting shop and a steel underframe shop. The former building will be located on the site of the old lumber yard and will be 160 x 450 ft. The underframe shop will be 110 x 300 ft. and will be equipped for steel work entirely. Construction work will be started at an early date, with the intention of having the buildings completed as soon as possible.

The Gillette Safety Razor Company, Boston, Mass., is preparing plans for a large plant to be erected on Frelinghuysen and Evergreen avenues, Newark, N. J. The company has purchased a tract of land 809 x 1042 ft. and it is stated that a plant costing about $200,000 will be built there. This will necessitate the purchase of considerable automatic machinery used in the manufacture of frames for safety razors as well as some fine blade making equipment and grinding machinery.

The Covert Motor Vehicle Company, Lockport, N. Y., manufacturer of automobile gears, will be ready about August 15 to receive bids on two grinding machines for squared shafts, two vertical milling machines, lathes and drill presses for equipping its new plant. There is to be a main building 50 x 230 ft., three stories, and another building 24 x 100 ft., contracts for the construction of which were recently awarded. The plant is to be erected on Grand street, near the Erie Canal Locks.

The Frontier Boiler Mfg. Company, Henry A. Bittner, secretary, 168 Selkirk street, Buffalo, N. Y., is in the market for a combination punch and shear, bending rolls 10 ft. long with a capacity for ⅝ plate, 150 cu. ft. air compressor and a 5-ft. radial drill. Second-hand machinery that is in first-class condition will be considered. The company, which manufactures boiler tanks, &c., intends to erect a new plant as soon as a suitable piece of land which it has in view can be secured.

The National Meter Company is making an addition to its plant at First avenue and Forty-first street, Brooklyn, N. Y., and has been purchasing some special machinery in this vicinity for its equipment.

The Catskill Aqueduct.

Machinery men who specialize in rock drills, air compressors, conveying machinery and contractors' equipment are getting a good deal of business these days from the contractors who are at work on the construction of the new Catskill aqueduct in course of construction in Ulster County, N. Y., for the city of New York. This big aqueduct will be 100 miles long and will cost in the neighborhood of $161,000,000, and from this it can be seen that the expenditure for machinery for use on the work will be enormous. A number of machinery houses in New York, including a prominent manufacturer of rock drills, have received some good sized orders during the last few weeks, and while many of the contractors have plants in hand all of them will require more or less additional machinery before they have completed their work. There remain only two sections of the work to be let as yet, they being sections 10 and 46, and it is expected that John A. Bensel, chief engineer of the newly created Bureau of Water Supply of the City of New York, will act on them shortly. All of the successful bidders on the sections let so far have established offices at the work and some of them have subcontracted part of the undertakings. The firms now at work constructing the aqueduct are: Section 2, Thomas McNally & Co., original contractors, and the following subcontractors: R. K. Everetts, Cleveland Construction Company, Gore-Meenan Company, John Hart; section 3, McArthur Brothers & Winsten; section 11, Stewart-Kerbaugh-Shanley Company; section 12, T. A. Gillespie Company; section 15, Elmore & Hamilton Construction Company; section 16, King, Rice & Gannery; sections 17 and 18, American Pipe Construction Company; section 20, Mason & Hanger Company, subcontractors: Dravo Construction Company, Harry & McNeal; section 22, Patterson & Co.; section 23, Glyndon Construction Company; section 24, Bradley Construction Company, subcontractors: Harry & McNeal; section 25, C. W. Blakeslee & Sons; section 45, Pittsburgh Construction Company; section 47, Degnon Contracting Company, subcontractors: Carpenter & Boxley, James Pilkington, Dravo Contracting Company. The city of New York is now sinking the shafts for a siphon under the East Shore River west of Breakneck Mountain and all of the contractors mentioned above are actively engaged on the work.

Specifications are now out for the power plant of the large oil refineries the Standard Oil Company has in course of construction at Baton Rouge, La., and the purchasing of the equipment for the plant is being done at the company's offices at 26 Broadway, New York. The power plant specifications call for equipment to generate 1600 hp., and it is stated that later the plant will be brought up to 3000 hp. Many machinery men in this territory will remember the

extensive purchases that were made by the company for its refinery at Bayonne, N. J., and from all accounts this buying will be practically duplicated for the Louisiana refineries. Mr. Haupt, who had much to do with arranging the buying details for the Bayonne plant, has just returned from Baton Rouge, and from all accounts the engineers at Bayonne will arrange the machinery details for the new plant.

J. G. White & Co., 49 Exchange place, New York, have plans for a large power plant to be erected for the Poughkeepsie Electric Light, Heat & Power Company, Poughkeepsie, N. Y., and several machinery houses in this vicinity are bidding on the equipment.

The Peter Cooper Glue Factory, Maspeth avenue, Brooklyn, N. Y., is arranging to change its plant over from belt drive to motor drive, and has inquiries in the market for a 125-kw. generator and several electric motors, in addition to some other power accessories.

The May Manton Pattern Company, 132 West Twenty-seventh street, New York, is planning to build at Pacific and Malvern streets, Newark, N. J., a plant for manufacturing its paper patterns, which will consist of two buildings, the larger of which will be 28 x 120 ft. The power plant details have not been entirely arranged as yet and it is expected that inquiries will come before the trade for that equipment.

Ford, Bacon & Davis, contracting engineers, are receiving bids through their New Orleans office for an extensive addition to the power plant of the Memphis Street Railway Company of Memphis, Tenn. The addition will be a large one and the building and machinery it is estimated will cost $100,000.

The State Superintendent of Public Works, Albany, N. Y., has awarded barge canal contract No. 20D to the American Pipe & Construction Company, Philadelphia, Pa., upon the approval of the State Canal Board and the State Engineer. The contract provides for canalizing the Mohawk River between Yost's and Rexford Flats, about 36 miles, and was awarded at $2,661,041. The approval of the Canal Board and the State Engineer was necessary because the bid was over 10 per cent. in excess of the State Engineer's estimate.

Chicago Machinery Market.

CHICAGO, ILL., August 3, 1909.

Trade in machinery lines is expanding at a rate that is highly encouraging. Reasoning from past experience it was generally thought that, even though conditions were favorable to continued improvement, business would drag through July in an uneventful way without making much forward progress. The retarding influences of the season, however, proved insufficient to overcome the rising tide of business and the demand for equipment has continued to grow. Some time ago when the machine tool houses handling small and medium sized tools were fairly busy, those chiefly interested in railroad shop tools and other heavy duty equipment were less successful in securing orders; this inequality no longer exists since within the past few weeks a large amount of business of the latter kind has been entered. Something of the extent of improvement may be gathered from the statement of a prominent machinery house that its sales up to the present time this year were largely in excess of the whole of last year. Another machine tool dealer reports that sales totals for July are the largest of any like period in the history of the concern. All such interests have made decided gains, though some have not gone ahead as fast as others. The demand from makers of automobile equipment is still an important factor in the machine tool market, and all indications point to continued support from this quarter. While no new railroad lists have been put out since last report, orders for industrial machines and small groups of tools are more frequent from this source. There is also a good demand for concrete machinery and the leading makers of electrical equipment are taking on new business of considerable volume. At no time since the forepart of 1907 has the machinery trade in all lines been as active as at present and the future outlook is most promising. There is a good deal of inquiry for second-hand tools, but dealers find considerable difficulty in replenishing their stocks, owing to the high prices asked for salable machines. Two bankrupt equipments of Chicago concerns were disposed of last week at trustees' auction sale. Twenty-three machine tools were included in the two lots, besides some auxiliary equipment, most of which was taken by local dealers.

Machinery Requirements for New Shops of American Dredge Company.

The following list represents the machinery requirements of the American Dredge Company, which is building a new plant at Fort Wayne, Ind.:

One 72 to 76 in. vertical boring and turning mill, with two swivel heads on cross rail, arranged for motor drive; one 60-in. vertical boring and turning mill, motor drive; one 30-in. change gear head, screw cutting engine lathe, 9 ft. between centers, double back geared, motor drive; one 30-in. screw cutting engine lathe, equipped with five step cone drive; one 14-in. change gear head, screw cutting engine lathe, 6 ft. 6 in. between centers, motor drive; one 14-in. screw cutting engine lathe, with five step cone pulley drive; one 30 x 30 in. x 8 ft. stroke planer, with head on power operated cross rail, motor drive; one 24 x 24 in. x 8 ft. stroke planer, motor drive; one 24-in. back geared crank shaper, to take at least 4 in. shaft under ram, motor drive; one 24-in. back geared crank shaper, same specifications, except equipped with cone pulley drive; one 4-ft. reach radial drill, motor drive; one 20 or 21 in. upright drill press, with back geared variable power feed and lever and wheel feed, motor drive; one 12 or 15 in. upright sensitive drill, single spindle, capacity up to ½ in. drill; one internal key seating machine, capacity ½ to 1¼ x 12 in. keyways, motor drive; one pipe threading and cutting off machine, capacity from ½ to 4 in., motor drive; one single head bolt and nut threader, capacity from ¾ to 2 in., motor drive; one 20-in. wet tool grinder, belt driven; one twist drill grinder, capacity up to 2¼ in.; one 20-in. plain emery tool grinder; one 10-in. plain emery tool grinder; one 12-in. hack saw, heavy construction, capacity 6 x 6 in.; one radial wall drill, with 8 ft. arm, capacity up to 2 in. in plate work; one 150 ton hydraulic wheel press, capacity 58 in. wheel by 10 ft. between ram and headblock, motor or countershaft drive; one single end punch, 25 in. throat capacity, 1 in. hole in 1 in. plate, motor drive; one double end punch and shear, 25 in. throat, capacity 1 in. material, motor drive; one cold saw, capacity 20 in. I beam, motor drive; one bulldozer or bending machine for 8 x 8 x ¾ in. angles, motor drive; one 1500-lb. steam hammer, open frame, to be operated by compressed air or producer gas; one two-cylinder air compressor, capacity 140 cu. ft. free air per minute; one two cylinder two stage air compressor, capacity 350 cu. ft. free air per minute; one upright air receiver, capacity 150 cu. ft. free air; one upright air receiver, capacity 400 cu. ft. free air; one pneumatic compression portable riveter, 25 in. reach, 15 in. gap, capacity 1 in. rivet; one long stroke pneumatic riveting hammer; one pneumatic chipping hammer; one pneumatic drill, capacity 1¼ in. drill; one 33-in. band saw, motor drive; one 12 in. x 6 ft. hand planer and jointer, motor or countershaft drive; one 16 in. x 6 ft. hand planer and jointer, motor or countershaft drive; one 24-in. wood planer, motor or countershaft drive; one combination rip and cutoff table, saws 14 or 16 in. diamater, motor drive; one 18 in. x 12 ft. iron bed pattern makers' lathe, with or without power feed; one 18 in. x 12 ft. iron body gap pattern lathe, 5 ft. gap and 5 ft. swing between centers; one wood trimmer on iron stand, capacity approximately 15 x 6 in.; one portable pneumatic rivet forge; one stationary forge, with 36 x 36 x 16 in. deep firepan; one stationary forge with 24 x 36 x 10 in. deep firepan; one fan to supply two forges at 14 ounce pressure, motor drive.

The E. Z. Auto Go Cart Company, Beloit, Wis., has arranged to move its plant to Monroe, Wis., where facilities will be provided for largely increasing its output. With this end in view the capital stock has been increased from $25,000 to $50,000. The machinery in the present plant will be moved to the new site, but it is likely that some additional equipment will be required.

The plant of the Granite Brick Company, Fremont, Neb., which was recently completely destroyed by fire, will be rebuilt at once. All of the machinery in the plant, except a drying cylinder and brick press, was damaged beyond repair. New machinery required to re-equip the plant will include brick machinery, one 100 hp. high pressure boiler, one 75 to 100 hp. Corliss type engine, heater, pump, &c.

Having increased its capital stock from $25,000 to $50,000, the Portland Foundry & Machine Company, Portland, Ind., is preparing to erect a modern drop forging plant, foundry and machine shop and mill supply store upon a site of 4 acres recently acquired for this purpose. The company expects to make all kinds of automobile parts as well as hardware specialties, glass house castings, &c., and hopes to be ready to execute orders about January 1. Some of the machinery required has already been arranged for, but there is still a considerable amount of equipment to be purchased within the next 60 or 90 days.

New equipment recently purchased by the Davis Mfg. Company, Milwaukee, Wis., maker of high grade automobile and marine engines, includes a Foote-Burt four spindle vertical boring machine, also a four spindle valve seating machine, two Heald cylinder grinders, one Heald crank grinder, one No. 2 and one No. 3 Kearney & Trecker millers, one 32-in. Gray planer, three Milwaukee lathes, one Norton plain grinder, one Norton crank grinder and a Landis cam grinder, together with a line of drill presses suitable for engine work. The rapid expansion of its business has compelled the company to double the floor space of the new building erected last year and when completed the factory will be 164 x 205 ft., of saw tooth roof construction, steel trusses and concrete floors.

In order to demonstrate the effectiveness of variable speed clutch control as applied to a planer drive, McDowell, Stocker & Co., Chicago, are running on the floor of their Jefferson street storerooms a 26 x 26 in. x 8 ft. Whitcomb-Blaisdell planer connected up to a clutch of this type made by the Variable Speed Clutch Company, Milwaukee. The

results obtained have not only been highly satisfactory, but the interest shown in its operation emphasizes the attractiveness of practical work as a means of demonstrating the merit of machinery. This clutch was described in *The Iron Age*, April 8, 1909.

Bids will soon be asked on material and equipment for the erection and installation of an electric light and water plant for Granite, Okla. The estimated cost of these improvements is $45,000.

The Golden Glory Tunnel Mining Company, Denver, Col., is contemplating the installation of a hydro-electric plant upon its properties at Georgetown, Col., to develop from 350 to 400 hp. for the operation of its mines.

Cincinnati Machinery Market.

CINCINNATI, OHIO, August 3, 1909.

Satisfactory progress toward readjustment of the tool trade was made in this market during the first month of the last half and the month's end found an entirely optimistic tone prevailing among producers, which was largely shared by employees also, to judge from the outpouring on the last day at the fourth annual outing provided by the Cincinnati Metal Trades Association at Chester Park. Fifteen thousand workmen and all the officers and directors of the association enjoyed the day at play, notwithstanding rain and unpleasant weather conditions, and it was accounted one of the best in the series. There were 169 individuals concerned in 273 entries for prizes offered in the athletic contests. The close of July finds a number of large shops working overtime, a few running a night force, and all on full time with forces approximating from 75 to 85 per cent. of the payroll of early 1907, which was, as is well known, abnormal. A pleasing feature of the trade is the receipt of many orders from large iron and steel manufacturers in the Pittsburgh District for tools, showing conclusively the rapid improvement in the manufacturing lines. A fair sprinkling of orders have also come in from Europe. A manufacturer of portable electric drills has had cable orders from England and Japan, the Government of the last named country having bought quite heavily of these the last three months. Shapers are also strong in demand, one manufacturer having 30 of an improved type coming through in September, with but four unsold at this time.

Small and medium sized engine lathes continue in good demand, comparatively few orders having been received for the larger and improved heavier types being brought out by prominent manufacturers. Upright drills and drill presses, in point of demand, about parallel the phenomenal sales of milling machines. Some new types of heavy duty lathes, millers and planers are ready for announcement by local manufacturers, machines to which much thought and mechanical skill has been devoted the past year or more and which are confidently expected by their makers to create world wide comment.

The foundry melt is increasing rapidly and it is expected that ere the close of August the majority of those making miscellaneous castings in this territory will be running heats of from 8 to 10 tons daily. Interest is being revived in the Iron Buyers' Association, an organization of 1907, which sought to correct alleged evils in the trade from the buyer's viewpoint when iron was on an ascending scale, as it is now.

A Ft. Wayne, Ind., concern, the S. F. Bowser Company, is enjoynig an unusual run of prosperity. The tin shop department of the plant is on a schedule of 76 hr., and it is reported that the entire plant is running on a 10-hr. per day schedule.

The Imperial Motor Car Company, which was recently incorporated at Hamilton, Ohio, by G. A. Rentschler, George H. Helvey, C. U. Carpenter, George Stanly Helvey and Fred B. Rentschler, will manufacture gasoline cars and steam cars. All the men back of the enterprise are well and favorably known in the Central States—Mr. Rentschler, at the head of a great foundry establishment; George H. Helvey, the former general superintendent of the Hooven, Owens & Rentschler Company, engine builder; C. U. Carpenter, president of the Herring-Hall-Marvin Company, builder of safes; Stanley Helvey, for several years with the Allis-Chalmers Company at Milwaukee; Fred B. Rentschler, recently graduated from Princeton. The company has acquired the old Snyder paper mill plant on the Miami and Erie Canal, near the Butler County Fair grounds. Eight acres of land and some buildings in good condition will be utilized for the factory. Negotiations are in progress for the equipment of the plant, and it is hoped to be able to manufacture cars for the 1910 trade.

The Franklin Foundry Company, Columbus, Ohio, has leased two sections of a main building and 20 ft. of ground on Dublin avenue, that city, and will make improvements to its plant.

The Madison, Ill., plant of the American Car & Foundry Company has a contract to repair 1700 freight cars for the Illinois Central Railroad and they must be delivered in 90 days. The St. Louis branch has commenced work on 6500 new freight cars.

An effort is being made to retain in that city the plant of the Ohio Rail Company, West Newark, Ohio. The purchasers of the plant had decided to move it to Steubenville, Ohio. The promise of the purchasers to continue the plant was obtained on the signing of an obligation to raise for them a $5000 bonus, to be paid in equal installments during three years. The agreement also contemplates, it is understood, the expenditure at once of twice the amount of the bonus by the owners on the plant.

A report from Morgantown, W. Va., that a large independent producer is negotiating for a 15-acre site on the line of the Morgantown & Kingwood Railroad is confirmed by George C. Sturgiss of that district. The plant will be near that of the American Sheet & Tin Plate Company's South Sabraton plant and is expected to be about the same size.

Shelton Bros., foundrymen and machinists, Paducah, Ky., have a contract from H. C. Murnan to build for him a complete equipment of steamboat machinery and shaft to be installed in a large ferryboat which is under construction in Helena, Ark.

Cleveland Machinery Market.

CLEVELAND, OHIO, August 3, 1909.

Orders for machine tools have held up well during the past week and business on the whole with the local machine tool houses was as good during July as in June. Some of the dealers report an increase in the volume of sales last month, as compared with the previous one. The market is gradually broadening and more business is coming from steel plants and large manufacturers. There is also an increase in the demand from the railroads. The largest inquiry that came out the past week was from the Youngstown Sheet & Tube Company for about $75,000 worth of large tools, including lathes, planers, shapers, drill presses, &c. A fair volume of business continues to come from the automobile builders, but the most active buying is by makers of automobile parts. Milling machines seem to be more in demand than any other kind of machine tools and one machinery house reports that the manufacturer whose milling machie it handles is 10 weeks behind on deliveries.

Business with the local machine tool builders continues to improve and the working forces in their plants are being increased. There is a growing demand for machinists and a number of plants would put on additional men if they could be secured. The growth and activity of the automobile industry is held responsible for the present scarcity of machinists. Nearly all the available workmen have found employment in the automobile factories during the past few months and now that machine tool builders are in shape to add to the number of their employees they are having trouble in finding machinists. The demand for turret lathes, which has been good for the past two or three months, is holding up in very good shape, the buying being quite general and a fair volume of orders coming from railroads. The foreign demand is good, particularly from Germany. Builders of heavy machinery report a decided improvement in inquiries for steel plant equipment and ore handling machinery.

The demand for second-hand tools is active and dealers report a scarcity in the supply.

In the foundry trade there is some improvement in the demand for steel castings. The light gray iron foundries continue to have a good volume of orders and the most of them are running at near full capacity.

Sealed proposals will be received at the office of the secretary of the Board of Public Service, Cleveland, August 11, for a 350-hp. water tube boiler, superheater, smoke flue and appliances for the municipal electric light plant. On August 17 there will be received proposals at the same office for one 350 K. V. A. 2200-volt three-phase 60-cycle alternating current synchronous condenser, with exciter, switchboard panel, instruments and attachments for installation in the municipal light plant.

The Cleveland Collet & Machine Company is being organized, with a capital stock of $10,000, by J. L. Holstein and others, to manufacture adjustable collets and a line of small tools. The company will equip a plant in a block on High avenue.

The City Council of Canal Dover, Ohio, has approved plans for a new municipal electric lighting plant and has authorized the Service Board to receive bids and enter into contracts for the building and equipment.

The Wellman-Seaver-Morgan Company, Cleveland, reports a good volume of inquiries for ore handling machinery, steel plant equipment and mine hoists. Its estimating department is now very busy and the plant is being run at fuller capacity than for some time.

The Standard Foundry & Mfg. Company, Cleveland, is enlarging its plant by the erection of a building, 40 x 40 ft., to be used for the japanning of registers.

It is reported from Elyria, Ohio, that the Dodd Mfg.

Company of Chicago, recently incorporated with a capitalization of $300,000, will locate a plant in Elyria for the manufacture of carpet sweepers.

The B. & M. Machine Company, Akron, Ohio, has been incorporated with a capitalization of $10,000 by S. H. Boyd, K. L. Meredith, O. T. Lane, Allen E. Kile and A. T. Meredith.

The H. & H. Art Metal Mfg. Company, Cleveland, has been incorporated by John Hand and others with a capitalization of $15,000.

It is reported from Ashland, Ohio, that the Faultless Rubber Company of that place will erect large additions to its plant, involving an expenditure of about $100,000.

New England Machinery Market.

BOSTON, MASS., August 3, 1909.

July rounded out as a very good month for the machine tool dealers, while the average of business among the manufacturers was satisfactory. Strange to say, the latter part of the month was better than the first with some houses, the season failing to develop a deterring influence on buying. There is still room for improvement, of course, but for midsummer no one could expect a much better condition than that which now prevails.

A very great improvement is noted in the tool steel trade. Both large and small customers are buying freely, having abandoned their policy of ordering in very small amounts, taking care of pressing needs only. Where large consumers were purchasing a few pounds they are now taking tons at a time. Though the stocks of the dealers have been replenished in anticipation of a resumption of better business, they are finding it necessary to replenish their lines. One large house which deals practically exclusively in imported steels, convinced that the dull period was soon to end, put in a large stock, hiring an additional store and still another basement to hold its purchases. Business has become so good with this house that it has had to make recourse to the cable in order that it may be sure of taking care of its customers. July has proved to be a very good month with them, contrary to all their expectations, and there is no indication that the dog days will see any material slump from the present very satisfactory volume of orders. The trade looks to see the summer business largely surpassed in the fall.

The Boston labor bureaus report a letting up in the demand for workmen, but other New England centers are greedily seeking good men. Providence and its neighboring cities of Pawtucket and Woonsocket are clamoring for mechanics, and Worcester, Springfield and the Connecticut cities report a scarcity of skilled labor and a growing dearth of less experienced help.

The Imperial Machine Stamping & Welding Company, 606 East First street, South Boston, is in the market with the unusual inquiry for a welding machine to weld sheet steel and brass in lengths from 10 to 14 ft., the product being desired for a sanitary washing machine.

The Chandler & Farquhar Company, Boston, has taken the agency for the line of open side planers built by the Cleveland Planer Works, Cleveland, Ohio, and the heavy combination vertical milling and drilling machine of the W. B. Knight Machinery Company, St. Louis.

The Watertown Arsenal has out inquiries for an engine lathe swinging 22 in. and taking 10 ft. between centers, with an equipment of chucks; a back geared power feed drill, to drill up to 1¼-in. holes; a 16-in. shaper, electric drill, shaft straightener and hand pipe threading machine.

The Beltzer-Delcampe Welding Company, Bridgeport, Conn., is arranging to place on the market three sizes of oxy-acetylene welding machines, and is contemplating the sale of chemicals for use in the manufacture of oxygen.

There are no new developments in the proposed merger of the Pratt & Cady Company, Hartford, Conn., into the Chapman Valve Mfg. Company, Indian Orchard, Mass. The meeting of the directors of the former corporation last week did not act in the matter, no formal proposal having been submitted at that time.

The Springfield Street Railway Company, Springfield, Mass., is having plans prepared for a new repair shop. The system is a large one and the present facilities for repairs of rolling stock and electrical equipment are entirely inadequate. While details of the new shop are not available it will be a large one, considering its purpose, and will require cranes and a considerable list of new machine tools, including car wheel lathes or grinders.

The Worcester Pressed Steel Pulley Company, Worcester, Mass., has been incorporated under Massachusetts laws, with a capital stock of $100,000. The corporation is closely allied with the Worcester Pressed Steel Company, which operates a large plant at Barbers Crossing, and will occupy a portion of a new building, work upon which will begin immediately. John W. Higgins, general manager of the Worcester Pressed Steel Company, is president of the new corporation; Daniel G. Langlands, Boston, vice-president, and Robert S. Littlefield, Boston, secretary, these officers together with Arthur P. Higgins, assistant general manager of the Pressed Steel Company, and Anders G. Anderson, the superintendent, constituting the Board of Directors. The company will manufacture a new patented presser steel split pulley, the invention of Mr. Langlands. The actual work of manufacturing will be done by the Pressed Steel Company, whose equipment adapts itself for the work. The New England selling agent will be the James H. Roberts Company, Boston, of which Mr. Langlands is the president. The new building will be 80 x 104 ft., two stories, of mill construction. It is adjacent to the Boston & Maine tracks. It will be necessary to increase the power equipment of the works and it is probable that a 225-hp. gas engine outfit with electric generator will be installed. This matter has not been settled, however, as there is a possibility of taking power from the Connecticut River Power Company, in which case 300 hp. will be contracted for. The new pulley is made of cold pressed steel. It has no spokes, there being side disks inclosing the space within the rim, which renders it proof against accumulations of dust or other particles. Though it is a split pulley there are no clamping screws. It is held to the shafting by gibbed keys. The 3 and 6 in. sizes are already being manufactured, and eventually the line will run up to 48 in. The Worcester Pressed Steel Company reports that the last six months has seen the best business in its history.

The firm of J. B. Chapman & Co., 51 Taylor street, Springfield, Mass., coppersmiths, machinists and brass founders, established about 15 years ago, was dissolved July 15 and the business will be continued by the former managing partner, Thomas J. Rider, Mr. Chapman retiring on account of ill health.

The Osgood Bradley & Sons Company, Worcester, Mass., car builder, will come to no decision for the present as to replacing its plant, a large part of which was removed in the process of eliminating the city's grade crossings. It is known that if the business is continued it will probably be on a larger scale than before, in a modern plant, in which case a considerable amount of new equipment would be required.

The Connecticut Company, which operates the extensive street railway system in the territory including Bridgeport, Meriden and Waterbury, Conn., is to make important improvements at Bridgeport, including the erection of two car barns to cost about $500,000. It is presumed that repair shop facilities will be increased in connection with the work and that the company will be in the market for machinery later. The company is also planning the establishment of a great power station, to be located at Waterbury, if necessary permission is obtained to dam the Naugatuck River in order to secure a supply of water for the condensers, otherwise Bridgeport will probably be chosen as the site.

The Pequonnock Foundry, Inc., Bridgeport, Conn., manufacturer of gray iron castings, is to erect a new plant on a tract of land just acquired located on Fifth street in the eastern section of the city. The main building will be of steel, 75 x 140 ft. Much of the equipment will be furnished by Wonham, Magor & Sanger, New York, who are making the plans, but the company will require power, including a 50 to 60 hp. engine and boiler, sand blast equipment, &c. It is expected that the plant will be ready for occupancy in October.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of saddlery hardware, is to add to its works a one-story brick building 60 x 150 ft., to be devoted to manufacturing, in order to take care of increasing business.

The Mills Woven Cartridge Belt Company, Worcester, Mass., is to occupy a portion of one of the new buildings recently erected by the Spencer Wire Company of that city.

The Godfrey Bottle Stopper Company, Plantsville, Conn., has begun the manufacture of a patent bottle stopper, the invention of a Hartford man.

Milwaukee Machinery Market.

MILWAUKEE, WIS., August 3, 1909.

Every indication points to the fact that the Northwestern States, from Lake Michigan to Puget Sound, are now entering upon the most active period of industrial development that they have ever known. Milwaukee as one of the world's leading centers for the production of prime movers and electrical machinery is feeling the full force of the onward movement, for in an extension or new manufacturing plant of any kind one of the first requirements to be provided for is motive power. During many years the city has been celebrated as a builder of Corliss, slide valve and rocking valve engines, and, despite the large percentage of business that has been diverted within the past decade to manufacturers of steam turbines, gas engines and hydraulic turbines, the leading Milwaukee builders of reciprocating engines have steadily increased their production. Even allowing for the dullness of 1907-1908, the average yearly gain has been considerable, and the growing demand for air compressors, blowing engines

and refrigerating machines, the steam ends of which are practically identical with power engines, is strengthening the situation in this field. Particular mention of it is made to show, in connection with what has heretofore been reported concerning other types of driving machinery, that the advance in power requirements is general and means greatly increased production all along the line. New operating machinery of all kinds is, of course, needed in the same enterprises, and it will be found profitable by manufacturers of such to keep track of power plant additions in this section; not only those that are made for private account, but also by central stations in numerous communities, where the rapidly growing use of motor drive in factory extensions is increasing the commercial day load.

Machine tool builders in eastern and southern Wisconsin are having a good run of business, and were it not for the fact that some of these accumulated stocks during the dull period delivery on many orders would be considerably delayed. Most of the types manufactured in this State are such as milling machines, die presses, cutters, grinders, &c., which can be used in a great variety of operations; hence the field open to their sale is much less restricted than that of standard tools of the lathe or boring mill variety, and there promises to be no dearth of orders during the remainder of the year.

The Fred M. Prescott Steam Pump Company, West Allis, has taken contract for pumps for the new water works system at Bessemer, Mich., and the boilers will be supplied by the Milwaukee Boiler Company.

Shops and yards costing nearly $1,000,000 will be erected and equipped for the Western Dry Dock & Shipbuilding Company, Port Arthur, Canada. Electric drive is to be used throughout on a plan similar to that of the Fore River Yards at Quincy, Mass.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 3, 1909.

The month of July can scarcely be termed very satisfactory, as far as the general run of business is concerned. Reports from both manufacturers and merchants indicate considerable irregularity. In some cases a good volume of business has been transacted, there being instances where the month's aggregate has shown a fair increase, but speaking generally the trade has been rather quiet, the customary midsummer dullness being particularly noticeable. Few propositions of any magnitude have been closed in this territory, the bulk of the business being of a small character individually and covering pretty well the general range of the medium size standard types of tools. The automobile makers have probably been the most active buyers of equipment; the railroads have, as a rule, been very light purchasers. Some of the roads have bought a few scattered tools, but no general buying movement of any large character is in sight. Conditions look somewhat brighter in the general industrial lines, locomotive and car builders show increased activity, and some little business has developed from those sources. Iron and steel mills in this territory are decidedly more active, in a number of instances operating at full capacity, a condition which is considered quite encouraging by the machine tool trade, and while no great volume of business is anticipated during the current month, it is believed that a marked increase will be noted early in the fall. Manufacturers of machine tools are, as a rule, somewhat better engaged; the smaller plants, manufacturing to a large extent tools of a special nature, are operating at full capacity; the larger concerns, however, while gaining, are for the greater part stil very considerably under normal. Inquiries in general are not very extensive; there is a scattered demand coming from a variety of sources, but the demand is largely for single tools, with here and there a few tools for minor shop equipment. That for tools and equipment for export continues very light, occasional orders are taken, but they are mostly for equipment of a special character.

The second-hand machinery trade drifts along without any special feature. The demand is of an irregular character, confined to no particular class of equipment, and on the whole can hardly be termed satisfactory. A fair volume of business is to be noted in the boiler and engine trade, although these propositions, particularly when of any size, develop rather slowly.

More activity is to be noted in the foundry trade. A little more business in the way of machinery castings is reported. Steel casting plants are booking a greater volume of business, particularly from locomotive, car and ship builders, and are more encouraged with the outlook. Gray iron foundries are somewhat better engaged, the jobbing trade particularly showing an improvement.

The Southwark Foundry & Machine Company reports a real revival in business. Inquiries are coming out quite freely and are pretty generally followed by orders, which are usually placed without much hesitancy. The outlook is considered very encouraging, and it is believed that before the end of the year business with that company will be on a normal basis.

The Charleroi Water Company, Charleroi, Washington County, Pa., has, we understand, decided to construct a filtration system in connection with its water plant.

The Board of Commissioners of Public Grounds and Buildings of the Commonwealth of Pennsylvania will take proposals until August 10 for the building and complete construction, including heating, plumbing, electrical work and elevators, of a fireproof building for tent making and storage purposes, at the State Arsenal, Harrisburg, Pa., under revised specifications made under direction of the board. Drawings, specifications, &c., may be obtained from the Superintendent of Public Grounds and Buildings, Harrisburg, Pa.

The Philadelphia & Reading Railroad has awarded contracts for the reconstruction of 14 bridges on the line of the Perkiomen Railroad. The John A. Kelly Company, Philadelphia, has the contract for the substructures of all the bridges, while the bridges proper were divided, we understand, as follows: Three to the Phoenix Bridge Compay, nine to the McClintic-Marshall Construction Company and two to the Keystone Structural Company, Royersford, Pa.

William Steele & Sons Company has been awarded a contract to build a new dryer building, of reinforced concrete, 75 x 100 ft., for the George W. Blabon Company, Philadelphia. The same company will erect a number of new buildings in East Orange, N. J., for the A. P. Smith Mfg. Company.

The Energy Elevator Company is operating its plant at full capacity. Inquiries continue fairly active, and a good volume of business is being taken in hand and power elevators of various types. This company has recently installed a number of electrical power freight elevators in the anthracite coal district, while a number of hand power elevators of a ton and a ton and a half capacity have been shipped to the Pacific Coast. A hand power freight elevator has been shipped recently for export to Japan, while another of a similar type has been shipped to Porto Rico.

Government Purchases.

WASHINGTON, D. C., August 3, 1909.

The Isthmian Canal Commission will receive bids until August 23, Circular No. 527, for air compressors, feed water heater and other supplies.

The Department of the Interior, Washington, D. C., will receive bids until August 17 for remodeling the boiler plant at the Government Hospital for the Insane at Washington.

Bids will be received until August 26 at Jefferson Barracks, Mo., for nine heating boilers.

The following bids were opened July 26, Circular No. 521, for locomotive coaling cranes for the Isthmian Canal Commission:

Class 1, three 20-ton locomotive coaling cranes—Bidder 1, American Hoist & Derrick Company, St. Paul, Minn., $13,316; 6, Brown Hoisting Machinery Company, Cleveland, Ohio, $15,420; 7, Browning Engineering Company, Cleveland, Ohio, $13,250; 11 Orton & Steinbrenner, Chicago, Ill., $12,760; 15, Industrial Works, Bay City, Mich., $14,000; 17, Ohio Locomotive Crane Company, Bucyrus, Ohio, $13,000.

The following bids were opened July 27 for supplies for the navy yards:

Class 11, two cold metal saws—Bidder, 53, Henshaw, Bulkley & Co., San Francisco, Cal., $335 and $365; 86, Pacific Tool & Supply Company, San Francisco, Cal., $350; 121, Excelsior Equipment Company, Pittsburgh, Pa., $480 and $735.

The following bids were received July 24 for three vertical cross compound condensing steam engines for the Philadelphia Navy Yard:

Item 1, work complete; item 2, in accordance with specifications, but with bidders' modifications.

Robert Wetherill & Co., Chester, Pa., item 1, $46,510; 2, $46,510.
Wisconsin Engine Company, Corliss, Wis., item 1, $54,250; 2, $46,750; alternate, $42,000.
Nordberg Mfg. Company, Milwaukee, Wis., item 1, $60,500; 2, $49,500.
Hooven-Owens-Rentschler Company, New York, item 1, $64,659; 2, $54,159.
Shepherd Engineering Company, Williamsport, Pa., item 1, $58,185; 2, $52,185.
Ball Engine Company, Philadelphia, Pa., item 1, $49,468; 2, $45,287; alternate, $42,630.
McIntosh, Seymour & Co., New York, item 1, $57,470; 2, $50,900; alternate, $40,450.
Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., item 2, $61,500.

Under bids opened June 8 for machinery for the navy yards, the following awards have been made:

Niles-Bement-Pond Company, New York, class 31, one 80-ton overhead traveling crane, $17,600.
Alberger Condenser Company, New York, class 143, two feed water heaters, $1803.50.

Under bids opened July 3 for supplies for the Isthmian Canal Commission, the Browning Engineering Company, Cleveland, Ohio, has been awarded item 1, one 20-ton locomotive coaling crane, $6625, and item 2, one orange peel bucket, $600.

HARDWARE

ONE of our subscribers, whose opinions regarding freight matters are highly esteemed, takes exception to the time allowed shippers or receivers of merchandise for the presentation of claims against transportation companies for loss, damage and delay. Section 3 of the uniform bill of lading conditions, approved by the Interstate Commerce Commission and incorporated in the Official Classification, thus making the provisions applicable to both shipper and carrier, prescribes that "Claims for loss, damage or delay must be made in writing, to the carrier at the point of delivery or at the point of origin, within four months after the delivery of the property, or, in case of failure to make delivery, then within four months after a reasonable time for delivery has elapsed. Unless claims are so made the carrier shall not be liable." Our subscriber feels that the time for placing the claim in the hands of the transportation lines is too short and recommends that the time be extended to six months. The reports of the Interstate Commerce Commission indicate a spirit of fairness working for the co-operation of shippers and carriers in effecting a solution of the transportation problem. It is a fact, and a fact with which the Interstate Commerce Commission is familiar, that the transportation companies generally have been and still are arbitrary and negligent in the treatment of claims; and it is partially through the efforts of the commission that the transportation companies are gradually realizing that improvement in the treatment of claims must obtain and they are endeavoring to co-operate with shippers to that end. As indicative of the progressive spirit in this respect, a railroad official of the modern school has even advocated a short time limit in the settlement of claims. In prescribing the four months' time limit those considering the question assumed that this period should afford sufficient time for a consignee or receiver of freight to inspect goods and detect any loss or damage they were subjected to while in transit, and that any extension of that period after receiving the shipment might subject the property to losses and damage in other directions for which the transportation companies should not be held responsible. It was also decided that should the consignee elect to have the shipper present his claim at the shipping point, four months was ample time to get a report of the facts concerning the loss, damage or delay, together with other necessary papers, to the shipper, so that the claim could be presented within the required time.

Realizing the dilatory methods of many shippers in presenting such claims, and which for various reasons and causes they were not entirely responsible, the four months' time limit was decided upon with the idea of reasonably expediting action on the part of shippers. The fact that some uniform rule or time limit, one considered reasonable and just, has been established represents progress that will have a tendency to increase. While a minority might favor a longer period to prepare for the presentation of claims, the majority of shippers organized to handle such matters systematically would favor even a shorter period. If the shippers expect railroad companies to remedy the delays now attending the investigation and settlement of claims, they should co-operate with railroad companies in their efforts and be reasonably prompt in presenting them. Should hardship prevail, due to the requirement stated in section 3, appeal may be made to the Interstate Commerce Commission, a hearing arranged for, evidence for and against produced, redress of the grievance made and reparation granted the complainant if due, and the time limit required for the presentation of claims extended if found unreasonable or unjust to either or both parties concerned. The failure of the claimant to present his claim within the prescribed time limit as stated in the uniform bill of lading, and accepted jointly with the transportation line issuing, does not absolve the transportation company from acceptance and consideration of the claim, for the transportation companies are by the same instrument held responsible for negligence in the protection of property tendered them for transportation and the shipper also is granted the protection in such matters established by common law.

Condition of Trade.

Among the representatives of leading interests gratifying unanimity is observed as to good fall prospects, with greater emphasis in expressed opinions as to the possibilities for 1910 and 1911, when the continued high prices for large crops will have made possible heavier purchases. Manufacturers and merchants speak of better mails, more orders and better orders even now, much of which is probably attributable to the advances already established in some materials and finished goods. More life is shown in the market and the railroads are buying more freely in the lesser lines, as well as the tonnage necessities, which always come first. From a comparison made in a standard Hardware line it is found that the first six months' business of 1909 was 25 per cent. ahead of the corresponding period in 1908 and 20 per cent. less than for the same six months of 1907. It is also a fact that the first six months of 1909 have shown steady increases over the same months in 1908. Some orders now received bear evidence of having been taken from the want book in larger quantities for actual necessities rather than being a customary sorting up of stock. Reference is made to the prosperity of the farming community, which constitutes such a large percentage of the entire population; for many years it has harvested increasingly large crops at high prices and is in a position to buy freely when the upward movement gathers headway. This condition is not true of factory and other employees, some of whose incomes have been lessened in the last two years. Some factories are now working full time, especially on the finer grades of goods, in an endeavor to accumulate stock. There has been complaint that the medium classes of trade have not effected settlements as promptly as could be desired, which has necessitated some extensions in time for payments, but on the whole collections have improved.

Chicago.

Reports agree that business is expanding in a gratifying rate and that conditions are highly favorable to the realization of a prosperous fall trade. Unless some wholly unforeseen obstacle should be interposed the way now seems clear for a decided forward movement all along the line. A large portion of the small grain has already been safely harvested, the remainder is being rapidly taken care of, and an almost unprecedented corn yield is in

prospect. The adjustment of tariff schedules is in its last stages, and whatever detrimental influences the prolonged discussion of these issues may have had upon business will shortly be eliminated. The advance of $2 a ton on Wire and Wire Nails announced last week was not unlooked for, and is generally regarded as in line with current developments. It is rather too early to determine how demand will be affected by the new prices since buying for the fall season has scarcely begun, and will not be in full swing for two or three weeks. While large shipments are still going forward against contracts placed at low prices made in the spring, there does not seem to be any overstock in the hands of jobbers or retail dealers; moreover, the outlook for a heavy consumptive demand is unusually bright, so that the market will in all probability find steady support at the new level. A good deal of talk is heard about prospective higher prices in other lines, but outside of Builders' Hardware and Strap and T Hinges and Wrought Butts, on which prices have been slightly advanced, there have been no changes of importance toward higher levels. At the same time prices are firmer in many lines, and the feeling prevails that the general tendency is strongly in that direction. The market has not yet stiffened so uniformly, however, as to preclude the purchase of certain lines at prices favorable to the buyer. A contract for the Builders' Hardware requirements in the Blackstone Hotel, amounting to about $45,000, has been placed. The only other large order of this kind now pending in the local market is the Hardware for the City Hall. The next deal of notable size will be that of the new Sherman House, which is some time ahead.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—During the last two weeks the writer has been absent from business and spent the time some distance from home coming in contact with other business men. In conversation many of these have expressed their conviction that conditions generally have materially improved. Reference was also made to the increased orders received by iron and steel manufacturers and larger dividends owing to improved trade.

The steel manufacturers show heavy sales on orders since April 1, being the largest of any corresponding period in the history of trade, and the shipments of ore from Lake ports during the past two months show an increase of more than 65 per cent. as compared with same interval last year.

There is a strong feeling that the delay in completing the tariff bill has been really unnecessary. The measure will, however, doubtless be finally passed in a very few days.

The crops of the country are looking splendid. The very prosperous agricultural conditions during the past few years, especially the past two years, has induced a very happy feeling—not only among Western farmers, but practically over the entire country. Financial conditions have greatly improved in the last year.

Manufacturers are alive to the betterment in the situation and note an increased demand for goods. The losses of the last two years will now be largely overcome, especially in view of the advances in prices made within the last few weeks. The writer is glad to say that from all he has heard since leaving home, there is a decidedly better feeling as to the present and future trade of the entire country.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—In general, crop prospects continue very favorable. Notwithstanding floods in some sections and droughts in others a bumper corn crop is in sight. Business conditions in the Southern States do not seem to be as good as they are in the central Mississippi Valley and in the Northwest. Many sections in the Southwest are suffering from a long continued drought. But upon the whole prospects are excellent and the jobbing business in this city in all lines is reported to be very good.

The advance in the price of Nails and Wire was "pulled off" one week ahead of schedule time. This advance looks well on paper, but as all jobbers are well stocked at old prices it is a question whether there will be a serious attempt to obtain it from the retail trade. In light of past experience it would be something unusual if jobbers, without any combination or agreement, simply by a tacit understanding, would advance their prices 10 cents on Nails and Wire when all their warehouses were overflowing with the goods bought at old figures.

It must be admitted, however, the market on many lines is stiffening. Telegrams announcing the advance of 10 per cent. on Builders' Hardware were duly received and registered. There seems to be an overproduction and too much selling power in this line of goods. This country is scarcely big enough for our Builders' Hardware manufacturers. What they and other manufacturers need is a large foreign business to help them work off their surplus. But in light of the methods of revising the tariff it hardly seems foreign nations will be in the mood to exchange courtesies with us; failure of banking interests to get Steel Corporation stock listed on the Paris Stock Exchange is an evidence. We cannot get away from the natural law that when we build a wall around ourselves to keep the other fellow out we at the same time wall ourselves in.

As one of our local papers expresses it, it is interesting to see the will of 70 per cent. of the population of the United States for a revision of the tariff downward defeated by an organization opposed to the wishes of the people. This paper uses this instance as an illustration of the power of organization as opposed to the wishes of the great majority of the people.

The cost of living in this country is at a higher point than it has ever been. Everything a man needs to clothe and feed his family is more expensive. The value of a dollar of wages in the United States has shrunk substantially in purchasing power. After a while our people will realize the value of rice as a food. Sixty per cent. of the population of the world to-day is living on rice. It is an interesting fact that we can live on rice without using any other food. I am told this is not true of any other vegetable. Rice can be raised very cheaply over here. It can be prepared in many palatable forms for the table. If, on account of the great increase in the cost of living, we all go on a diet of rice probably we will have less uric acid in our blood and will reduce both the grocer's bill and the doctor's bill at the same time.

We also observe in our cities the increased number of apartment houses. Small families, instead of living at home, having their own houses and their own yards, are herding together in these apartments. Less trouble with servants—more independence for the ladies in the family—more freedom to just lock up and visit or lock up and travel. Well, who knows? maybe apartments are drawing their people from the old fashioned boarding houses. Maybe the apartment is a half way ground between the boarding house and the real home. I call some of my apartment house friends "cliff dwellers."

But what has all this got to do with a trade report on a hot day? The trouble with these trade reports is all of us say the same old thing over and over again. It becomes tiresome to write it. If our physical bodies cannot wander away on a vacation we can at least allow our minds a little vacation at the expense of what the old time novelist always called "my kind and considerate reader."

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Trade conditions throughout the corn belt and east and west of the Missouri River continue very satisfactory. Business in all lines is flourishing, and the volume of goods daily going into consumption continues with a steady regularity. Prospects for a very large yield of corn are practically assured. The business basis of this part of the country is the crops, which have been excellent for a series of years, bringing substantial values. To this can be added the largely increased productions of live stock, also commanding profitable prices, so that conditions generally are in admirable shape, and with the required amount of the circulating medium to move Eastward the

immense business offering no obstacles appear in sight to disturb the present satisfactory outlook.

Cleveland.

W. BINGHAM COMPANY.—From all we can gather, the outlook, we think, is brighter for a protracted period of prosperity than it has been for some time. Reports show bumper crops everywhere. The fruit crop through Ohio will be very large, and from other States encouraging reports are in evidence. It is reported that transportation companies are busy preparing to handle the largest volume of business in their history, mainly agricultural.

The appointment of Charles R. Crane, the new Minister to China, is meeting with hearty approval all over the country, especially in commercial circles. He seems to be the right man going to the right place, and with his broad, comprehensive views of business, no doubt his administration will contribute in a very large measure to the American manufacturers' future prosperity in China.

The general Hardware business in this section is very good at present. Just what we predicted months ago is taking place now. Manufactured Hardware has been altogether too low, considering the demand, price of metals and the wage scale, and prices must advance.

Many manufacturers are telegraphing and writing advances to take effect on their different lines of goods at once and making void all former quotations, especially so in Builders' Hardware, Small Shelf Goods, Cotton Sash Cord, Bolts, Chain and many other articles. We believe we have been advising rightly and we repeat that merchants should sort up their stocks liberally with jobbers who have the goods before all these new prices take effect. We believe in the old maxim, "Goods well bought are half sold." Hardware jobbers throughout the country invite their retail customers to buy liberally at once and their orders will be taken care of.

Grateful showers and warm sunshine have done a great deal in the Middle West to enlarge crops of all kinds. Every one in this section is contented to let well enough alone and improve the present opportunity.

Boston.

BIGELOW & DOWSE COMPANY.—July is usually a dull month and after the Fourth trade is always sluggish. Every one expects a vacation either that month or the following. Customers may place orders for future shipment, but order light for immediate wants. Every one lacks energy these hot days.

Although trade is light, vacations keep those at home very busy doing double work. Trade throughout New England has shown a steady improvement over last year, and the past six months will show a handsome increase in sales. Every interest is prospering. Immense sums are being invested in mill improvements. Labor is fully employed and wages are at a high standard. We hear but little of strikes this summer. Summer hotels are doing a rushing business, which brings millions into our section every summer. High wages do not offset the low rates for money or stop building improvements.

Everything indicates a large and prosperous business this fall. Prices of Hardware are firm and advancing. The larger dealers are contracting for their fall purchases, believing it wise to have their stocks in shape for the large trade that is sure to come. With the tariff settled all doubts are settled as to the immediate future. That the early buyers will be winners is a safe proposition.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The July Hardware business in this section was a disappointment. May and June business was very satisfactory. The continued rains during these months had the effect of giving the farmers and retail merchants the blues, and this was felt very sensibly in reduced purchases during the month of July. The rains in July, especially the latter part, were not excessive; in fact, the season was very favorable for handling hay, threshing wheat and other farm work.

From the best information we have been able to gather the crop conditions have improved a little in the past two weeks, but most of the crops have been seriously damaged by the rains. Dull trade in July is accounted for to some extent by the fact that farmers have been so busy that they have not had time or inclination to trade.

The weather during part of July has been so exceedingly warm that dull business has been considered almost a blessing. A good portion of the force is away on vacations, which makes it all the more unpleasant for the stay at home crowd. The final outcome of the Southern crop situation will not be known until the latter part of August, but we think a fair crop of corn and cotton will be made, notwithstanding the unfavorable season which we have gone through. With high prices still ruling we see no reason why we should not expect a very good fall trade. Collections are about as usual at this season of the year.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Business conditions have been progressing as favorably as expected. Just now and for some time ahead the weather is the big factor in the case. Thus far this season it has been more than usually favorable, and if it continues so in large degree the Northwest will have harvested very fine crops.

The estimate now on the crop of spring wheat in Minnesota and the two Dakotas is that it will exceed that of 1908 by 75,000,000 bushels. All other crops are also in unusually good condition, and there have probably never been more favorable crop prospects all around throughout the Northwest than now exist. While hail storms and other casualties may reduce expectations to some extent, it is not now likely that there will be such reduction as will seriously affect general business conditions.

Trade is active, prices are firm and the present outlook is very satisfactory.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Unless we take into consideration the crop outlook, which is a yearly affair, we can now figure with reasonable assurance that the last obstacle to a free and increasing business is about to step aside. Of course, we mean the tariff.

We are now half way through the summer and yet the Senate was not hurried in its consideration of the tariff bill because of the summer heat, as was expected, and it is, therefore, fair to conclude that if any important objection can be effectively brought before the attention of Congress the final passing of the bill may be deferred, but as Mr. Taft has expressed himself as reasonably well satisfied, and there are apparently no strong influences able to make any further objections of consequence, we will soon be referring to the Dingley Act as something of the past, and operating under new schedules of duties that may bring many unexpected changes in conditions in at least some of the industries.

We have never been very much disturbed over the price of steel rails. We never could quite see where the average consumer could get any great benefit through the reduction of seven-fortieths of a cent per pound in the duty on steel rails. It would take a big reduction in the freight rates to reduce the cost of supplying "the poor man's breakfast table," and it is not at all likely that a much heavier reduction from the present duty of $7.84 per ton on steel rails would ever change freight rates one penny. Furthermore, if the railroads were to import their steel rails some of the railroads at least would miss an opportunity of hauling rails from American mills to other railroads not running through sections where steel rails are produced.

One of the greatest objections to the protective system is in the fact that under protection too large a proportion of the poor man's earnings are absorbed paying rents, grocery bills and shoe bills. After these bills are paid only a small portion of the average wage earner's income is left. A large portion of what remains must

be spent for cotton and woolen goods. Thus after these bills are paid there is but little left for other commodities, and when all these things are taken into consideration it is not at all surprising that still higher wages are demanded.

The last week in July showed a distinct improvement in business. No doubt this improvement was due partially to the advances that have been made on Nails and Wire, Builders' Hardware and Bolts.

In some sections we hear reports to the effect that tobacco and corn are both in splendid condition. From others, where rains have had more influence, merchants are at least temporarily depressed. The hot winds in Texas have done a certain amount of damage in some sections.

From the reports made so far it is not unreasonable to expect that our agricultural products will be worth at least as much as last year, when they were valued at $7,800,000,000, with a possibility of their being worth considerably more.

The greatest obstacle to a free business is the disposition on the part of the merchants still to buy in small quantities and in meager assortments.

Baltimore.

CARLIN & FULTON.—Trade must have improved somewhere and somehow, if increased bank clearings and also increased railroad earnings, as reported in the financial columns of the daily press, mean anything; and that this improvement is likely to continue and possibly be of much greater magnitude is shown by the strength of the stock market, as securities do not generally advance with a prospective stagnation in trade.

The earnings for June of the United States Steel Corporation were the largest of any month since October, 1907, at which time prices of their commodities were higher than those of to-day, and we must also remember that as yet the immense purchases of the railroads for needed equipment have hardly begun. Throughout the entire United States trade has been pursuing a hand-and-mouth policy in buying, and there is no accumulation of manufactured goods in the hands of either manufacturer, jobber or retailer.

The crops of 1909 will add many millions to the wealth of the country, most of which will undoubtedly go into circulation. We cannot indefinitely continue to starve our stocks, especially when there is an almost certainty of an enormous demand for goods with a tendency toward higher values.

The increase in building operations throughout the country has already resulted in the manufacturers of Builders' Hardware withdrawing old quotations and announcing an advance of 10 per cent. over former costs. The advance made in Wire Rods and all Wire Products will result in higher costs to the manufacturers of Bolts, Screws, Chains and many articles too numerous to mention.

As yet there are many goods in the line of Hardware which are extremely low, and the conservatism which kept the average buyer from overloading his stock will now suggest that it is wisdom to anticipate the requirements of the future and get ready for a demand which is inevitable. Already in our local market the buyers who have come on from the South have exceeded in number quite largely those who have visited the market in previous years, and the indications are that this is not a spasmodic improvement in business but an activity which will continue for some time to come.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—Business continues flourishing here in all lines of Hardware except those directly dependent on lumbering. This seems to be the only one of our industries to feel the effect of tariff tinkering, though to tell the truth most of our productive industries seem to be in the scape-goat class, as Congress seems disposed to sacrifice Western interests, notably hides and lumber, to the clamor for tariff revision. I believe that out here everybody is in favor of a fair tariff reduction, but we object to having our own industries left without protection when the industries of the East and Middle West receive increased assistance.

But it is certain that even tariff tinkering cannot very long hold back the Pacific Coast, with its matchless and almost undeveloped resources. More and more people are coming to realize this fact and are coming to settle here. The trains from the East are filled with visitors, a large proportion of whom intend to settle here. There is renewed activity in railroad building, especially in the central Oregon region, the largest productive section of the United States without a railroad. When this is once opened up it will provide homes for many settlers. Taking everything together, we look forward to an increase in the prosperous times of the Pacific Northwest.

At the present time conditions are excellent. Our collections are very good, showing that there is plenty of money in the country, and we expect this condition to continue, as all of our crops promise well and we expect high prices.

NOTES ON PRICES.

Wire Nails.—New business now being received by the mills is light, as is usually the case during August, all orders taking the advanced price of $1.80 per keg, base, which went into effect on July 24. The mills are still filling orders at the $1.60 and $1.70 price, taken previous to the advance, and are being operated to full capacity. At some mills surplus stocks have been absorbed, and occasional delays in shipping result from inability to fill orders promptly. Prices are well maintained, and quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.80
Carload lots to retail merchants	1.85
Less than carloads to jobbers	1.85
Less than carloads to retail merchants	1.95

New York.—The notice of the advance in the price of Wire Nails by manufacturers brought a number of orders to local jobbers from nearby territory to be filled at the price that had been ruling. Nails can still be purchased at $2, base, in small lots at store, but some jobbers have notified their trade that a 5-cent per keg advance will be asked.

Chicago.—Just prior to the advance of $2 per ton, effective July 24, some heavy orders were placed by the trade, but such purchases were to a large extent subject to specifications within 60 days. Business of moderate volume was entered last week at the new prices which have governed all transactions subsequent to the advance. The mills are being operated at full capacity, and but for the fact that surplus stocks were available to draw from deliveries would be lagging considerably. These stocks are pretty well exhausted, and the mills from now on will be dependent upon their output to supply the demand. The practical certainty of an unusually bountiful harvest of all crops foreshadows a heavy fall trade, to take care of which will likely tax productive capacity to the limit. Prices are firm at the following quotations: $1.98, Chicago, in carloads to jobbers and $2.03 in carloads to retailers, with an advance of 5 cents for less than carloads from mills.

Pittsburgh.—New buying of Wire Nails in the past week, or since prices were advanced from $1.70 to $1.80 per keg, has been light, most jobbers and consumers having covered their wants for 60 days prior to the advance. All the mills have a large number of contracts on their books taken at the $1.60 and $1.70 price, on which heavy shipments are being made, buyers specifying quite freely. New demand is dull, as it always is at this season of the year, but we are advised that the price which went into effect July 24 is being absolutely maintained. We quote Wire Nails at $1.80, base, per keg, f.o.b. Pittsburgh, in carload and larger lots.

Cut Nails.—No change has been made in the price of Cut Nails. Demand is showing some improvement and the idea of an advance in price is entertained to some extent. The market may be fairly represented by the quotation of $1.75 to $1.80, base, f.o.b. Pittsburgh. Iron

Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

New York.—Demand in the local market continues about the same as for some time. A general quotation for small lots at store is on the basis of $2 per keg, though some jobbers have advised customers of a 5 cent per keg advance.

Chicago.—Although the trade has not as yet been advised of a revision of Cut Nail prices, an early advance is expected in view of the higher prices established on Wire Nails. The probability of such action is further increased by the better demand experienced. Jobbers' stocks are moving at a better rate and the market exhibits a decidedly firmer tone. In the absence of official advice of any change we quote as the minimum prices now available as follows: In carloads, to jobbers, Steel Cut Nails, $1.88; Iron Cut Nails, $2.03.

Pittsburgh.—While no official change has been made in prices of Cut Nails, some of the manufacturers are acting independently and are quoting higher prices. New business is coming in at a fair rate, and specifications against contracts are being received quite freely by the mills. We quote Steel Cut Nails at $1.75 to $1.80, base, f.o.b., Pittsburgh in carload and larger lots, and are advised that the lower price is minimum of the market.

Barb Wire.—Previous to the recent advance of $2 per ton the jobbing trade placed orders covering its requirements, and these are now being filled by the mills. New business is light. Prices are maintained and quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.80	$2.10
Retailers, carload lots	1.85	2.15
Retailers, less than carload lots	1.95	2.25

Chicago.—Not much new business has been entered by the mills since the advance of $2 a ton announced last week. Trade in the South is rather slow in developing, as it was expected that new orders would begin to come in freely from that section of the country about the middle of July. The mills are still making shipments of specifications against uncompleted contracts, and now that the prices for the season have been fixed an active movement is looked for in the near future. Prices are unwaveringly held at the new schedule, which we quote as follows: To jobbers, Chicago, carloads, Painted, $1.98; Galvanized, $2.28. To retailers, carloads, Painted, $2.08; Galvanized, $2.33; retailers, less than carloads, Painted, $2.13; Galvanized, $2.43. Staples, Bright, in carloads, $1.98; Galvanized, $2.28; carloads to retailers, 10 cents extra, with an additional 5 cents for less than carloads.

Pittsburgh.—New buying is light, as this is the dull season in the Wire trade, and in addition the trade largely covered its needs prior to the recent advance. The mills have a fair amount of tonnage on their books on contracts against which buyers are specifying freely. The market is firm and we now quote Galvanized Barb Wire at $2.10; Painted, $1.80 per ton in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Fence Wire.—Mills are unable to fill specifications on contract orders as promptly as buyers want them to, owing to the insistent requests for prompt shipments. The market is firm at the following quotations per 100 lb. to jobbers in carload lots as follows, on a basis of $1.60 for Plain and $1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75

Chicago.—In order to provide for the prospective heavy demand for Fencing, manufacturers began placing orders three or four weeks before the recent advance. Such orders were entered at an advance of $1 to $2 a ton over the prices then ruling, according to the forwardness of delivery required. A fair amount of business is coming in at the new prices and consumers are clamoring for deliveries, which the mills find difficult to make as fast as desired. The market is reported to be absolutely firm, at the following quotations: Carloads, to jobbers, $1.78, base, f.o.b. Chicago.

Pittsburgh.—New buying in Fence Wire is light, this being the off season in this trade, and jobbers and consumers pretty well covered their needs for 60 days ahead prior to the last advance. The mills have a good many contracts on their books against which buyers are specifying quite freely. The market is firm, and we quote Plain Wire at $1.60, Galvanized $1.90 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Sash Weights.—Owing to the continued advance of raw material, manufacturers of Sash Weights have advanced the price, which is represented in a general way by the quotation of $23 per ton to the large trade and $25 per ton in smaller shipments.

Shot.—Under the date of August 2, a new schedule of prices was sent out by manufacturers of Lead Shot, showing a decline of 10 cents per bag of 25 lb. on Drop, Buck and Chilled. Dust Shot remains unchanged. Following are the new prices which are subject, as usual, to a discount of 10 cents per bag of 25 lb., in ton lots:

Drop Shot, sizes smaller than B, 25-lb. bags, $1.60 per bag; 5-lb. bags, $0.40 per bag.

Drop Shot, B and larger sizes, 25-lb. bags, $1.85 per bag; 5-lb. bags, $0.45 per bag.

Buck and Chilled Shot, 25-lb. bags, $1.85 per bag; 5-lb. bags, $0.45 per bag.

Dust Shot, 25-lb. bags, $2.30 per bag; 5-lb. bags, $0.50 per bag.

Sheet Zinc.—An advance of ¼ cent per pound is announced by the manufacturers of Sheet Zinc under date of August 2. The price is thus made $7.25 per 100 lb., f.o.b. mill, in 600-lb. casks, of the thickness from Nos. 9 to 19, inclusive, and of the widths from 32 to 56 in., inclusive, and of lengths from 72 to 96 in., inclusive. The discounts given in quantities are as follows:

	Cash with order. Per cent.	Quantity. Per cent.	Total. Per cent.
Carload lots	3	5	8
9000-lb. lots	3	3	6
6000-lb. lots	3	2	5
3000-lb. lots	3	1	4
Less than 3000 lb.	3	0	3

Rope.—Seasonable quietness characterizes the Cordage market, this month being regarded as one of the quiet ones of the year in this line. The following quotations represent the market for moderate quantities: Pure Manila of the highest grade, 8¼ to 8½ cents per pound; lower grades of Pure Manila, ¼ to ½ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7½ to 7¾ cents per pound; base, Commercial grade, 6½ cents per pound. Rove Jute Rope, ¼ in. and up, No. 1, is quoted at 5 to 5½ cents per pound.

Iron Rivets.—The market for Iron Rivets, which has been somewhat demoralized, is stronger and there has been an advance in this line equal to about 5 per cent., traceable to the recent advance in Wire products. The market generally may be represented by a discount of 80 and 5 per cent.

Nuts.—As a result of the recent advance of 1-10 cent per pound in the price of Hot Pressed Nuts, the market is represented by 5 9-10 cents off Square, Blank or Tapped Nuts and 6 4-10 cents off Hexagon Blank or Tapped Nuts. No changes were made in Cold Punched Nuts. The usual concessions are obtainable for carloads or large orders and there is some reason to believe that the advance is not always rigidly maintained.

Window Glass.—The regular meeting of the Western Window Glass Jobbers' Association has been postponed until about the middle of September owing to the absence of a number of the members on vacations. The matter of wages to be in force during the coming fire is in the hands of manufacturers' and workers' committees. The impression prevails to some extent that skilled workmen will demand an increase in their pay, as they have fared badly in this regard for the past two years. Demand does not show any noticeable increase in this market, and regular quotations are adhered to as closely as conditions will permit. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains are as follows: New England

States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory shipments, Single, 90 and 45 per cent.; Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts 5 per cent. better than other States; in the Southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 and 45 per cent. on Double, from jobbers.

White Lead in Oil.—A good jobbing business for this season is reported by manufacturers, one of the larger interests being three or four days behind its orders. The market is steady and quotations are as follows: In 100, 250 and 500 lb. kegs, 6¾ cents per pound; in 25 and 50 lb. kegs, 7 cents per pound, with the usual advances on smaller packages.

Linseed Oil.—Unsettled conditions continue a prominent feature of the market, owing to low prices having been offered by a crusher who dropped his price to 50 cents per gallon for carload lots, but withdrew it later. The market for Oil in carloads may be fairly represented at 54 to 58 cents, on the basis of Western Raw, according to the seller. Very light demand results from these prices, as usual on a declining market. Large buyers generally have their requirements to October 1, covered by contract orders. On the basis of Western Raw, 5 bbl. lots are quoted at 59 to 60 cents per gallon and City Raw, 61 cents per gallon, with the usual advance of 1 cent for less than 5-bbl. lots. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—The market during the week has been firm and ½ cent higher, owing to export demand at Savannah, and to the feeling that perhaps the damage to the new crop of Turpentine may have been sufficient to reduce receipts in September. The New York market is represented by the following quotations: Oil Barrels, 51 to 51½ cents; Machine Made Barrels, 51½ to 52 cents per gallon.

ONE of the most important matters decided at the general conference of secretaries of retail Hardware associations, which was held in Chicago on the 23d and 24th ult., was the selection of dates for a number of the 1910 Hardware conventions with a view to avoiding conflict as much as possible, as follows: North Dakota, the last week in January; Wisconsin, first week in February; Nebraska, Illinois and Pennsylvania, second week in February; South Dakota and Indiana, third week in February; Minnesota, Missouri and Ohio, fourth week in February, and Iowa, first week in March. The conference was attended by representatives of 15 associations, and several of the National officers were also present. All the secretaries of mutual insurance associations identified with the Hardware field were in attendance, and they held a separate meeting at which insurance matters were specially considered. Each session of the conference had a full attendance, and the liveliest interest was manifested throughout, the unanimous opinion prevailing that this annual gathering is very stimulating and beneficial in promoting association work. A. R. Sale, Mason City, Iowa, presided, and J. Frank Barr, Lincoln, Neb., officiated as secretary.

THE PURITAN CORDAGE MILLS, Louisville, Ky., which has been busily engaged for some months past in the erection of a new and up-to-date plant for the production of strictly high grade Sash Cord, All-Thread Cotton Rope, Wrapping Twine and Clothes Line has now completed the factory and is booking orders for these products. The management of the plant is under the efficient supervision of C. L. Sweet, formerly connected with several of the largest works in this line in the country and well and favorably known to the trade.

A. E. BRION, president of Peter A. Frasse & Co., 130-132 Worth street, New York, will sail on the new Hamburg-American liner Cincinnati August 21, to be gone about two months. Mr. Brion's trip is solely for business and one that he makes at regular intervals. He will cover portions of Great Britain and the continent.

Ladies' Furnishings in Hardware Window Display.

THE accompanying illustration represents a humorous window display lately made by the Evans Hardware Company, Statesville, N. C. The floor of the window was covered with lap robes. Pedestals were made by nailing pieces of boards about 4 in. square, or round, on each end of 1 in. square sticks, of different lengths, the pedestals being then covered with crepe paper. Twelve hats were on exhibition, all made of Hardware articles carried in the company's stock. For instance, the hat in the middle at the extreme left was made of a large chopping bowl, with an enamel pudding pan placed on top, a cartridge belt running around the pan and a carving set stuck in the belt. The "Merry Widow," priced $9.00, was made of a large tray with an inverted

The Evans Hardware Company's Window Display of Ladies' Furnishings.

wooden bowl on top, and a stove poker for hat pin. Crepe paper was used in trimming most of the hats, except a few which were trimmed with various colored lap robes. The banner hat marked "sold" was composed of a No. 3 galvanized wash tub, 4 lap robes, a wash board for a feather and a decoy duck for bird.

Two handled cotton hoes on the floor had a price card reading: "Hose, 70 cents per pair." Garden Hose was priced "10 cents per foot, 2 feet, 20 cents." Hose clamps were used for Hose fasteners. Steel Wire Drill Spouts were used to represent "Hair Rats." Ordinary Gunpowder was offered for sale as face powder and dry Red Paint as face paint. A pair of Hedge Shears, a Sickle and a Horse Rasp were displayed as a Manicure Set. Horse and Mule Shoes, bearing appropriate signs, were scattered about. Stove Pipe Collars were used to represent ladies' collars and so on. A large sign above the display read: "Ladies' Furnishings à la mode, surely up to date." The window, which was arranged by C. E. Sloan, one of the company's clerks, attracted a large number of people and was the subject of much favorable comment.

FRANK M. STARKWEATHER, for some years connected with the National Enameling & Stamping Company, Milwaukee, Wis., died last week. Mr. Starkweather called on the jobbing trade in Missouri River territory, with whom he was exceedingly popular, and enjoyed the esteem and confidence of a host of associates and friends.

This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Turning Stock Three Times a Year.

Other replies to the query. "Is it possible to make money in the Hardware business without turning stock three times a year," are given below. These letters with others previously published show that there is considerable diversity of opinion and experience and that there is no regular rule in the matter. An intelligent and comprehensive summary is found in the answer of an enterprising New Mexico merchant who simply says that a man can make money provided his profit is large enough and his expense account small enough compared with the amount of business done.

FROM MINNESOTA: Our opinion is that a merchant would be unable to make any money on a stock of Hardware without turning the stock at least three times.

FROM OHIO: We believe it is possible to make money in the Hardware business without turning stock three times in the course of a year, provided your expenses are not over 10 to 12 per cent. of your total sales. If the expense of doing business reaches 17 to 18 per cent. on your sales and profits, even safely figured on an average basis, you would lose out. It is, of course, a great proposition to turn stock as often as possible, but local conditions and the situation have much to do with the results.

FROM NEW JERSEY: If the proprietor is to have anything for his effort he must turn his stock three times or more.

FROM ILLINOIS: It is possible to make money in the Hardware business without turning the stock three times a year. It all depends on the class of goods which is sold. If the business runs very largely to staple goods, then the stock will naturally be turned more often, but the more times you turn the stock the greater the expense; consequently the business which runs more largely to profitable goods and less to staples is more desirable than the one which is turned more often and consists more largely of staples. We know it is a habit of some men to make a large number of turns a year, regardless of the expense, class of goods they are selling, &c., whereas if more attention were paid to the desirable lines and staples not pushed so extensively the turning of stock might not be so great, while, on the other hand, the expenses would be less and the net profit considerably better.

Influence of Staples.

FROM ARKANSAS: This depends on local conditions. We cannot turn stock three times a year. Owing to the great difference in local and carload freights there are quite a number of items that we have to order in excess of present requirements, hence if we turn stock twice a year we consider having done well.

FROM NEW YORK STATE: In my own experience I would be pretty near "scared stiff" if conditions shaped themselves so that I was turning my stock only three times a year in a business of any size. It seems to me that this condition would be equivalent to sending for the undertaker. In a very limited field, with practically no expense for clerk hire or rental, there might be eked out a bare living for the proprietor; but even under these circumstances there is no good business reason for stocking up with goods that cannot be made to show an average of more than three turns a year. It is my belief that nowadays money is made by turning capital frequently; not by the initial investment.

Departments in Hardware Stores.

A house in New England writes as follows in regard to the subject of dividing Hardware stores into departments, which has been discussed at some length in these columns:

FROM MASSACHUSETTS: It seems to me that the creation of many actual divisions in the arrangement of Hardware stores of small proportions with actual departmentizing lines is unwise, although it does seem wise from the standpoint of greatest efficiency.

It has been my experience that the division of work on practically a factory plan—having the various sections or departments of the store responsible to a so-called department head, and thence reporting to the office executives—is a very feasible and practical plan. In this manner the stock man or boy has his individual pride in the care and arrangement of his stock, and the cleaning up and keeping filled; while his superior is held to account for these conditions and is not troubled with the detail to such an extent that he does not have time to be a party to portions of interviews with traveling salesmen or large buyers of the class of goods in his department.

Factory Plan.

In this system of departmentizing the minute detail is relieved from the proprietor, and a larger proportion of co-operation exists from the individual parties through the possibility of the development of their individual resources.

I do not think it is wise to departmentize to the actual extent of keeping salesmen to sales in their own department and thus create the feeling that their responsibility is only within their own department confines. I do think a certain amount of friendly pride, almost "competitive" pride, develops for the general good through the working out of imaginary "department" conditions, and the opportunity for increasing individual interest, effort and responsibility thereunder.

Friendly Pride.

Incorporation and Selling Stock to Farmers

One of our readers recently brought up the question as to whether or not it would pay to incorporate and sell a small amount of stock in the company to influential farmers in the neighborhood. He also desired advice as to the desirability of incorporating his business. This question has aroused a good deal of discussion and we have published a number of letters in regard to it. The interesting letter given below comes from a prominent Canadian merchant of large experience. It will be noted that the idea meets with the approval of our correspondent, who also enumerates some of the advantages of conducting business under a corporate form rather than a partnership:

It would certainly be very advantageous to interest in a company influential residents of the locality, but the manager should guarantee at least 6 per cent. dividend and this would facilitate the sale of shares. A man taking stock in a company considers it as his own and speaks well of same; he therefore helps to advertise the company and influences trade.

Corporation Advantages.

Among other advantages of joint stock companies with limited liability, over the individual, the ordinary partnership or the partnership with silent partner are the following:

1. Bankers and business men prefer dealing with a joint stock company, for the paid up capital if all stock subscribed is fully paid cannot be withdrawn or decreased, but it may be impaired by loss.

2. They are better secured in case of death, sickness, disability, or even bad conduct of one of the principals, for he may be dismissed and cannot force the refund of his shares from the other shareholders.

3. In ordinary partnership a member may ask, on giving due notice, the dissolution of the firm, and the withdrawal of this partner will greatly affect the credit standing of the firm and in some cases ruin it; but will not in a joint stock company, for he can only sell his shares to another and the capital stock remains unchanged. The same principle applies in case of death.

4. In ordinary partnership the whole of your wealth is responsible not only for the liabilities of the firm in regular business transactions, but all accidents which may be caused by the carelessness of one of your employees to himself or your customers, such as an elevator accident, touching electric wires or in the handling of cases of goods or the runaway of your horse. You are responsible for all of these.

5. You are also guarded against errors of judgment in

agreements or contracts either through haste, inexperience or inadvertence of yourself, partners or employees.

6. In joint stock companies you are only responsible for the amount of the shares you have subscribed and if paid you have nothing more to disburse.

7. Joint stock companies facilitate the management of business. If more capital is needed, the directors issue new stock and sell the necessary amount of shares without admitting a new partner or partners, as with regular partnership agreements.

8. If you think you have too much interest at stake, with joint stock companies you need nobody's consent but simply sell your stock. Ordinary partnership requires mutual consent of partners and a new agreement.

9. If you wish to interest your son in your business in a joint stock company you have no permission to ask to transfer a few shares. In a partnership consent of your partners must be obtained.

10. In a joint stock company you insure all your property not invested in your regular business against all liabilities connected with the company's debts.

11. If you have shares in a joint stock company and wish to borrow money, you transfer as collateral security your shares and effect the loan. In ordinary partnership you cannot use your partnership interest to borrow money.

12. By incorporation you simply double your borrowing powers and your individual credit is not affected. It also permits you to interest your best employees with the object of keeping them satisfied in your employ.

13. In case of death your interest in a joint stock company will be much more valuable to your estate or family than it would be in ordinary partnership, for in the latter when dissolution occurs you lose all the value of the good will of the business to which you may have contributed very largely.

The key of our life, that passes all wards, opens all locks, is not I will, but I must, I must, I must—and I do it.—*A. H. Clough.*

Enthusiasm.

"Enthusiasm generates the impulse that drives manhood on to noble achievements," to quote the Rev. Madison C. Peters of New York City. It arouses a supernatural heroism in one's own forces. It is the driving force of character. It makes strong men. It arouses unsuspected sources of ability. The man without enthusiasm in his work has lost the race of life before starting.

To a man sneering at excitement a Western editor pithily replied: "There is only one thing done in this world without excitement and that is to rot."

Men fail because they flinch, fly the track, and yield before the obstacles that beset their path. Emerson truly remarks that "every great and commanding movement in the annals of the world is the triumph of enthusiasm."

Dickens illustrated his saying, "There is no substitute for thoroughgoing, ardent and sincere earnestness," by living day and night with the characters of his creation.

Correggio when young saw a painting by Raphael. His soul drank in its beauty as flowers do the moisture from the mist. Awakened to the consciousness of artistic power and burning with the enthusiasm of enkindled genius, the blood rushing to his brow and the fire flashing from his eye, he cried out, "I also am a painter!" That conviction carried him through his studies, blended the colors on his palette, guided his pencil and shone on his canvas, until the glorious Titian, on witnessing his productions, exclaimed, "Were I not Titian I would wish to be Correggio."

Michael Angelo was so filled with enthusiasm for his art and so afraid that money might taint his brush that he refused to accept any pay whatever for his masterpieces in the Vatican and St. Peter's.

Balzac's father tried to discourage his son from the pursuit of literature. "Do you know," he said, "that in literature a man must be either a king or a beggar?" "Well," said the boy, "I will be a king." His parents left him to his fate in a garret. For ten years he fought terrible battles with poverty, but he came out victorious.

"I can't" never did anything. "I'll try" has accomplished great things. "I will" has wrought miracles.

The Resourceful Salesman.

From some standpoints a trust is good picking for the salesmen in competition. Merge a dozen factories. Instead of 12 salesmen there will usually be only one to represent them all in given territory. It is true he will have a wide range of goods, and, perhaps, price advantages. But the half dozen salesmen of small independent factories will get many an order. They will get business because there is a disposition among buyers to keep competition alive for strategic purposes. And they will get trade because trade may be compared to a pie, of which each salesman is pretty certain to get some sort of a slice. No matter what disadvantages they may work under as to goods, prices, capital, if they are *salesmen*, and have all the resourcefulness and personality that goes with salesmanship, they will get a satisfactory slice of the pie when it is cut just because they are six to one.—*James H. Collins.*

Analyzing a Business Proposition.

No general rule in regard to the consideration of important business problems has been of greater service to me than that which may be tersely stated in the words, "Let the other man do the talking." The soundness of this maxim has been so conclusively demonstrated, so far as my own experience goes, that I do not hesitate invariably to adhere to it and to urge it as a cardinal rule that will serve on all occasions. The logic of this procedure is apparent when it is remembered that every man who is charged with the responsibility of presenting an important business proposition goes to his task prepared to answer questions and objections which the man with whom he desires to treat is most likely to offer. I doubt if there is an exception to this rule. "What questions will he ask me and what objections will he raise?" furnishes the groundwork for the preparation which every man makes for the presentation of a business proposal to the man he hopes to interest. When these questions are brought forward he is ready to answer them; by asking the questions naturally suggested by his statements you are playing directly into his hands and are doing precisely what he desires you to do—carrying out the line of campaign which he has devised. He is ready to meet you at every point with the answers and arguments carefully prearranged and best calculated to win success for his cause.

Promoter Comes Prepared.

But what is the result if you place the burden of conversation on him, force him to do the talking and fail to come forward with the questions which he has prepared himself to answer? Simply this: He is thrown off from his predetermined line of attack. This naturally disconcerts him and he finds himself obliged to adopt a new line of campaign. So long as you are attentive to his arguments he must keep on presenting them until he has literally "talked himself out." In the course of this process he is bound, sooner or later, to drop a word here and there which will give you the clew to his motives and aims and which will place in your hands the possibility of getting to the bottom of the subject.—*W. T. Fenton.*

New Line of Attack Necessary.

E. W. Simpson has purchased the Hardware stock of J. F. Mendenhall, in Gove, Kan.

Art Crafting in Metal.

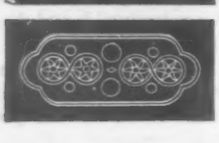
A Useful Manual for Amateurs.

The Revival of the Fad Offers an Opportunity for Hardwaremen—Profitable Business Built Up by Merchants Making a Specialty of This Line—Tools and Supplies Required.

"ART Crafting in Metals for Amateurs"* is the title of a handbook by F. Alexander, which treats of the subject in a practical and eminently satisfactory manner and in a clear and interesting style. The illustrations, which give many examples of art metal work and of the tools employed, add much to the attractiveness and usefulness of the volume. The principal topics discussed, as indicated in the titles of the chapters, are materials, appliances, tools, preparing the work, pieced work on thin metals, working on wood and lead, working on pitch, repoussé work, finishing, forming and mounting. These are followed by some valuable suggestions on designs and designing.

This very convenient and timely volume will doubtless be much appreciated by those who have given some attention to the kind of work described and will also lead many others to take up this refined, artistic and useful handicraft.

A Collection of Amateur Home Crafted Art Metal Subjects.



Suggestions of Tray, Panel and Sconce Patterns.

Revival of Interest.

Reference has previously been made in these columns to the revival of interest in amateur art metal work. This useful and interesting diversion was popular in this country some 25 years ago, but the usual reaction followed and but little attention was paid to it except by individuals here and there until recently, when there has been a substantial revival of the fad. At the present time many persons, particularly women and children, and not a few men, are finding pleasurable and even profitable diversion and a useful method of occupying their spare time in this form of art crafting.

A Ready Market.

The term art crafting in metal usually refers to the ornamentation of thin sheet metal with pierced or raised designs and the fashioning from this material of various useful or ornamental articles. Such work appeals to people who are artistically inclined, have good taste and originality, and can acquire some facility in the use of simple tools. The list of articles which may thus be produced covers a wide range and represents an almost limitless field of style and design. There is quite a ready market for them, not only in bazaars, fairs, private exhibits, &c., but even in shops good prices will be paid for attractive pieces combining usefulness and beauty. Therefore, while many people have taken up the art purely as an interesting occupation for spare time, others have made it a source of considerable revenue, and have been able to command some little income in return for the time and trouble given to the work.

Den Lantern, Pierced Work.

Completed Candle Shade, Pierced Work.

Completed Candle Shade, Pierced Work.

Opportunity for the Hardwareman.

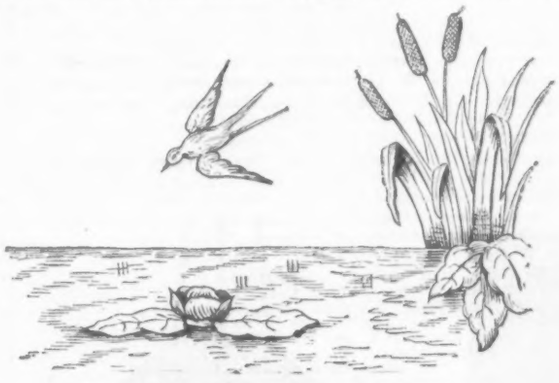
There is an opportunity here for Hardware merchants to supply the materials and tools employed in this metal work. They may thus advance a little the regular confines of the Hardware trade and attract attention to a line which will doubtless be novel and interesting to a good many who visit their stores. The cost of a moderate outfit of tools and material would not be very great. More important than the profit likely to be realized would be the benefit resulting from the

* "Art Crafting in Metal for Amateurs: Being the Art of Ornamenting Thin Metal with Pierced and Raised Designs," by F. Alexander. Illustrated. The Fort Hill Press, Samuel Usher, 176-184 High street, Boston, Mass.

impression given of progressiveness and enterprise on the part of the merchant, and the adding of another attraction to his establishment.

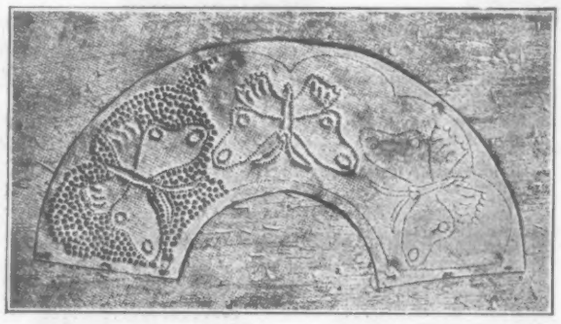
Materials Involved.

The materials which may be worked on, of course, include gold and silver, but for ordinary amateur work these are not practicable. Copper, brass and iron are



Water Effect Produced with Repousse Tools.

generally employed, and lead is also used for a number of purposes in carrying on the work. These materials, of course, a merchant who would cater to this class of trade must carry in stock in desired grades, sizes, gauges, &c. He must also be able to furnish certain appliances which the amateur art craftsman may wish to purchase, although many of them are frequently home made. These include Wood and Lead Blocks, Chaser's



Brass Mounted for Piercing.

Bowl, Pitch Pan, Anvil and Anvil Stakes, Brazing Blow Pipes and Blowers, Stoves or Bunsen Burners, &c.

Tools Yield Excellent Profit.

Tools, however, represent the most important source of business. These cannot be home made, and the merchant who establishes himself as a source of supply in a community of reasonable size where art crafting is popu-

Cherry Pattern Fern Dish, Pierced Work.

lar may derive an excellent profit from the sale of these Tools. They include Hammers of various kinds, Mallets, Snips or Hand Shears, Piercing Tools, Chasing Tools, Curved and Straight Tracers, Matting Tools, Picks, Border Tools, Cup and Ball Tools, Oval Tools, Dapping Dies, Repoussé, Tools, Tool Holders, Spatulas, Squares, Scribers, &c.

Models and Designs.

Finally, the merchant specializing in this line must be able to show models and furnish a varied assortment of designs from which his customers may work. Some of these are illustrated, and many suggestions regarding the work and its requirements and necessary equipment are to be found in Mr. Alexander's book, which, ap-

Pierced Work Shade for Electrolier.

propriately, comes from Boston, where the fad has had a very large following and where nearly all materials, supplies, Tools, designs, &c., connected therewith may be purchased by merchants in other parts of the country.

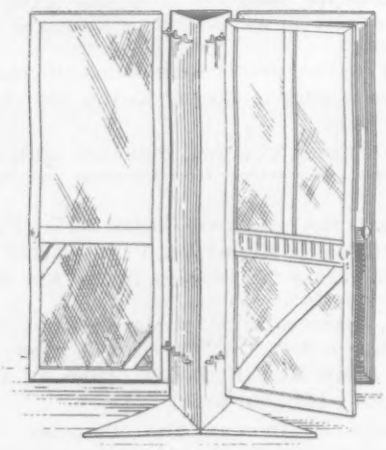
THE W. H. DAYCOCK, JR., COMPANY, 81-83 Fulton street, New York, which has for several years marketed Galvanized, Black and Corrugated Sheets in Greater New York and adjacent territory for the account of the Zug Iron & Steel Company, Pittsburgh, Pa., has been made the sales agency for the product of this company in New England, New York, New Jersey, Maryland, Virginia and in Pennsylvania, Philadelphia and east of Philadelphia. Previous to the establishment of the W. H. Daycock, Jr., Company Mr. Daycock had been selling Galvanized and Black Sheets, Copper Sheets and kindred manufactured Sheet Metal Goods for upward of 25 years, and has a wide circle of friends, principally among jobbers and large consumers of these products. Among other manufacturers represented by the company are the Edwards Mfg. Company, Cincinnati, Ohio, Conductor Pipe, Eave Trough, Metal Ceiling and Shingles, Spanish Tile, Siding, Rock Face and Plain Brick, &c.; Buffalo Copper & Brass Rolling Mill, Buffalo, N. Y., Sheet and Roll Copper, and Benjamin P. Obdyke, Inc., Philadelphia, Pa., Conductor Pipe, Elbows and Shoes.

THOMAS W. FRITTS, president of the Tom Fritts Hardware Company, Chattanooga, Tenn., has disposed of his interest in the company to W. E. Mills and associates. J. C. Parks, vice-president and assistant general manager, will continue as manager of the Hardware department, and the business will be conducted practically under the same management as heretofore. Mr. Mills is well known in the supply business, having had many years experience with C. E. James & Co., and lately as president and general manager of the James Supply Company. The new management will take over everything in the way of Hardware and supplies, Mr. Fritts continuing to handle Wagons, Buggies, Harness and Saddles and Farming Implements, under the firm name of Thomas W. Fritts & Co., occupying a building opposite the Patten Hotel, with a frontage of 310 ft. on Market street.

W. J. THOMAS has accepted a position with the Penn Hardware Company, Reading, Pa., as assistant to the sales manager. Mr. Thomas was for 16 years connected with the Reading Hardware Company, the last three years occupying a position in the sales department of the company.

Standard for Displaying Sample Screen Doors.

THE home-made arrangement for displaying Screen Doors, shown herewith, is in use in the store of C. K. Lawson Hardware Company, Hastings, Neb. The standard is made triangular in shape, of three 12-in. boards 7 ft. long, and is kept in an upright position by supports 2 ft. in length, extending in three directions.



Standard for Displaying Sample Screen Doors Which Economizes Floor Space.

two being shown in the illustration. Cornice hooks, 2½ in., are screwed into the standard and large screw eyes into the doors, these serving as hinges. Eight doors can be sampled and the doors fold back close to each other when not being shown to customers. The standard is made of hard pine, oiled, and makes a very nice fixture, easily removed in the fall and replaced in the spring.

JOHN J. SLATTERY, who recently resigned as president of the Todd-Donigan Iron Company, Louisville, Ky., being succeeded by R. W. Donigan, was active in the Iron business of that city for more than 50 years and was for a long time connected with the Louisville Rolling Mill. After the failure of the Louisville Rolling Mill he became identified with W. B. Belknap & Company, now the Belknap Hardware & Mfg. Company, and was with them for a number of years. The Todd-Donigan Iron Company started in business in 1881, and he was its president until the time of his resignation. No one is more highly esteemed in the Iron and Heavy Hardware line than "Judge" Slattery, a courteous gentleman of the old school, and the travelling men particularly in their visits to Louisville will miss his kindly greetings. Mr. Slattery retires in the best of health, but feels he should now give place to the younger men.

W. L. SANDFORD has been appointed manager of E. C. Atkins & Co.'s Chicago branch house. Mr. Sandford enjoys a large acquaintance among the Hardware jobbing trade, having represented the Atkins interests on the road for the past nine years, during which time he has called on jobbers exclusively. Mr. Sandford's first experience was with the Russell & Erwin Mfg. Company, with whom he was associated for a number of years. Later he accepted a position as buyer for Morley Bros., of Saginaw, Mich., and subsequently became sales manager for the Marshall-Wells Hardware Company, Duluth, Minn. Mr. Sandford will continue to call on as many of his old friends as his duties in connection with his new position will permit.

FRANK H. SMITH, recently of the Smith & Bishel Company, Middletown, Conn., has purchased the Hardware business of Wilson & Burr in the same city.

CONTENTS.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers catalogues, price-lists, quotations, &c.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM WOOD-PECK HARDWARE COMPANY, successor to the Wood Hardware Company, Newburgh, N. Y. The company conducts a wholesale and retail Hardware, House Furnishing, Paint and Builders' Supply business.

FROM SKINNER HARDWARE COMPANY, succeeding the Castlebury Furniture Company, Castlebury, Ala. The management of the business continues unchanged. The company handles Hardware, Furniture, Buggies, Harness, &c.

FROM W. M. GLENN & Co., who succeed Lufkin Hardware Company, Lufkin, Texas., carrying a general line of Hardware.

FROM WEST SIDE HARDWARE COMPANY, Keifer, Okla., whose store has been destroyed by fire. The company handled Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Paints, Oils and Sporting Goods.

FROM MUIR & GROSS, who have opened up a new store at Saline, Mich. In addition to general Hardware they will carry a line of Stoves, Paints, Sporting Goods, &c.

FROM W. S. DAVIS, Stewartville, Minn., who sustained a loss by fire of $33,000 on building and retail stock, insured for $22,000. The lines carried included Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Paints, Oils, Sporting Goods, Jewelry and Silverware.

FROM CHARLES EDMUND GRUBB, Altoona, Pa., carrying a stock of Hardware, Stoves, Sporting Goods, Farm Implements, Automobile Supplies, Machinery, &c.

FROM ROBERTSON-MYERS HARDWARE COMPANY, which has recently engaged in business in Carlisle, Ark., carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM OVERSTAD & HOVERSON, who have opened two stores in Beach and Sentinel Butte, N. D., doing a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Agricultural Implements, Paints, Oils, Sporting Goods and Furniture.

FROM HANS PEDERSEN, who has succeeded Schmidt & Pedersen, Kenterville, Idaho, handling Shelf Hardware, Stoves, Tinware, Window Glass, Paints and Oils.

FROM C. A. HEDLUND, who has succeeded Reed & Hedlund in Atlanta, Neb., handling Shelf Hardware, Stoves, Tinware, House Furnishings, Window Glass, Paints, Oils, Sporting Goods, Furniture, &c.

FROM SINGLETON, HENRY & Co., who have started in business at 174 South Main street, Memphis, Tenn. A retail stock is carried, including Shelf Hardware, Stoves, Tinware and House Furnishings. Messrs. Singleton and Henry were formerly with the Memphis Hardware & Stove Company.

FROM HATCH & BRYAN, who have purchased the business of the Andrew Hardware Company, Walla Walla, Wash., handling Shelf and Heavy Hardware, Stoves, Tinware, Window Glass, Paints, Oils and Sporting Goods.

A COTERIE of tourists, all members of the Hardware Club of New York, now recreating in Europe, arrived at Gibraltar July 18 and expect to be back in New York some time in September. The party comprises Edward P. Stoughton, Joseph A. Fuller, Edward L. Goodsell and John J. Teeple.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for our Catalogue Department and for notice in this column.

BARNEY & BERRY, Springfield, Mass.: Catalogue 1909-1910, showing their line of Ice Skates for men and women, Skate Shoes, Ankle Supports, Extra Parts for Skates and Skating Accessories.

HOLLAND FURNACE COMPANY, Holland, Mich.: Catalogue illustrating and describing the Window Chute, a Coal Chute for residences fitted with glass, the latter protected when in use, resembling a window, it also admits light.

F. H. EVANS, 596-614 Kent avenue, Brooklyn, N. Y.: Circulars relating to Roofing Kettles and Crescent Expansion Bolts.

ISHAM-MILLER COMPANY, Butternut, Mich.; July special folder, illustrating Iron Culverts and Royal Road Drags.

MORROW MFG. COMPANY, Elmira, N. Y.: Printed matter relating to the Morrow 3 in 1 Drill Chuck; three sizes of Taper Shanks for Tangless Drills; also the Morrow Ball Bearing Drill Chuck.

C. E. JENNINGS & Co., 42 Murray street, New York: Illustrated booklet, envelope size, 16 pages, describing No. 1½ Arrow Head Hack Saw Blades, all hard, tough and flexible; fully warranted.

HAMBLIN & RUSSELL MFG. COMPANY, Worcester, Mass.: Discount sheet No. 140, applying to catalogue of 1908.

IRELAND & MATTHEWS MFG. COMPANY, Detroit, Mich.: Illustrated circular of Spun Brass, Copper and Nickel Plated Cuspidors and Heavy French Plate Bathroom Mirrors.

Gummed Address Slips for Use on Envelopes.

W. C. HELLER & CO., Montpelier, Ohio, have had considerable trouble by having mail intended for them addressed to Montpelier, Vt., or Montpelier, Ind. Sometime since they tried out the plan of enclosing addressed envelopes in their letters. Out of 1000 addressed envelopes thus sent out less than 20 were used. The firm then experimented with gummed slips, one of which is

Gummed Address Slip for Use on Envelopes.

reproduced herewith reduced in size. About 500 of these have been used on letters, statements and invoices and this method has proved an effective one, as many replies are now received with one of the slips pasted on the envelope. The firm encloses a few of the slips in each catalogue mailed and pastes the stub end of the slip on the lower part of every letter. The slips are perforated so that the address portion can be detached from the stub.

Colonial Brush & Mfg. Company.

THE Colonial Brush & Mfg. Company, recently incorporated in Wisconsin, has taken over the Hendee Wire Brush Company and the Hendee-Katz Brush Company of Milwaukee. This step involves an entirely new organization, in which the management of these companies and their two plants have been consolidated in a large modern factory building located at 348-352 Florida street. Modern machinery has been installed in the new plant, which is equipped to manufacture Wire, Bristle and Fiber Brushes and Brooms, to which a general line of bristle and fiber goods is being added. Among the special lines made by the Colonial Brush & Mfg. Company

are Painters' Fine Steel Wire Scratch Brushes, Steel Wire Butcher Brushes, Brewers' Brushes and Brooms, Foundry and Machine Brushes of all kinds, Steel Wire, Bristle and Fiber Horse Brushes, Brushes for tanners' use., &c., also the Hendee line of Combination Bristle and Wire Hair Brushes and Clothes Brushes. The reorganized company is under the direction of E. F. Streich, who has had extended experience in the manufacture of Bristle and Fiber Goods.

The A & B Stove Company.

THE A & B Stove Company, which for more than a year past has been manufacturing the Michigan vapor stoves and ovens under the name of the Grand Rapids Stove Company, Grand Rapids, Mich., expects to occupy its new plant now being constructed at Battle Creek, Mich., by September 1. The new company has a capital stock of $350,000, of which $229,600 is paid in in cash, and the cost of the plant now being built will when completed amount to $125,000. Electric current supplied from outside sources will supply the motive power of the factory, and an individual water system will be installed. Enough business has already been secured to give employment to 150 men at the start. It is the purpose of the company engaged in this enterprise to make a full line of high grade Gas and Gasoline Stoves, and the trade will soon be supplied with literature showing the character of goods to be offered. The officers of the company are F. K. Berry, president; J. A. Alexander, vice-president and general manager, both having been formerly connected with the American Stove Company; Lewis C. Wurzer, second vice-president; W. O. Henderson, secretary; P. C. De Vol, treasurer. Mr. De Vol, who was formerly engaged in the retail Hardware business at Council Bluffs, Iowa, is well known in the Hardware trade as former president of the Iowa Retail Hardware Association, having served two terms in that capacity.

The Bushnell Silo.

The Bushnell Tank Works, Bushnell, Ill., manufacture silos which are sold exclusively to the trade. In construction the silo staves are tongued and grooved, exactly matched and beveled and dressed on both sides. The staves are made of Gulf cypress, unless something cheaper is desired, from 2-in. stock, if not otherwise specified. Full length staves are used as far as possible, and where it is necessary to splice a stave, never more than two pieces are used and the pieces are of standard lengths, to make every piece in the silo interchangeable, whether a full stave or a piece. In a two-piece stave the manufacturer's mortise joint is used, so that the stave may be just as good, so far as tightness is concerned, as if one piece. The doors are tongued and grooved, and each one is securely locked in place by the company's positive lock door fastening, and with a 1-in. bearing all around; the door is said to be absolutely airtight. Bolts are used throughout the silo, always with the heads inside to present the least possible surface to the acids of the silage. No nails are used, so as to give the necessary smooth surface inside the silo. The hoops are of mild steel, rolled to an exact fit for the silo on which they are used, and threaded with cut thread, plenty of space being allowed for all necessary adjustment. Hexagon nuts are used and malleable iron lugs.

The Little Giant Folding Sled

The Richards Mfg. Company, Aurora, Ill., has added to its line of Hardware specialties the sled shown herewith. The advantages of the folding construction, which is the particular feature of the sled, is the compactness it affords, making it convenient for storing, shipping and handling. The runners, made of ⅝ in. Bessemer spring steel, are 35 in. in length and are securely attached with corrugated clips bolted to the wood top with nickel plated bolts. The top is of dry hardwood 24 in. long, 11½ in. wide and 7-16 in. thick and is finished in red, blue and green. The steel parts are finished in black baked enamel. It will be noted that there are no obstructing braces to come in contact with the snow, the entire space between the runners being clear. The sleds are packed one dozen in a box 36 in. long, 12 in. wide and 15 in. deep, each sled being wrapped in heavy express paper. The net weight is 8 pounds each, and the shipping weight is 110 pounds per dozen.

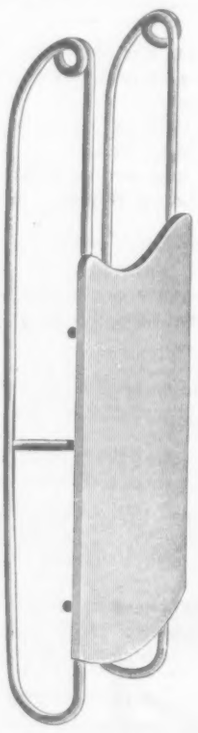


Fig. 1.—The Little Giant Folding Sled with 35-In. Bessemer Spring Steel Runners.

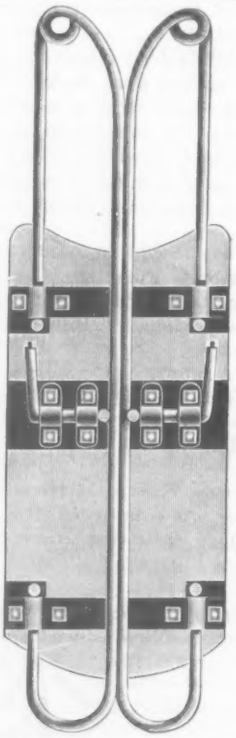


Fig. 2.—Folding Feature of the Little Giant Sled.

Shades and Candlesticks.

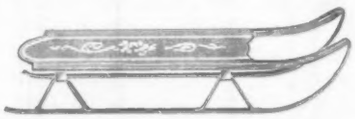
The Turner & Seymour Mfg. Company, Torrington, Conn., is this season handling a line of shades in connection with the gas and electric portables which it makes. This enables merchants who sell portables to purchase shades from the same concern. The company also makes a line of cast brass Colonial candlesticks, one pattern of which is herewith shown.

Cast Brass Colonial Candlestick.

THE HART & COOLEY COMPANY, New Britain, Conn., and 79 Chambers street, New York, has been awarded the contract for new Lockers to be installed in the Bedford branch of the Y. M. C. A., Brooklyn, one of the largest and finest of Y. M. C. A. structures in Greater New York.

Coaster No. 35.

The sled herewith shown is offered for this season by the Toledo Metal Wheel Company, Toledo, Ohio. It is 33 in. long, 12 in. wide and 5 in. high, well furnished and decorated. It is made of steel, with second growth

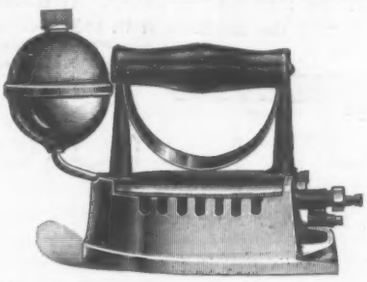


Coaster No. 35, Made of Steel with Second Growth Oak Hand Rails and Cross Braces.

oak hand rails and cross braces, and is referred to as being very light, strong and swift. The company states that one of the best features of the coaster is that it will not skid, this being prevented by a shoe on the runner. The sleds are designed to retail at $1, and are packed six in a crate; weight, 80 lb. per dozen.

The Ideal Self-Heating Gasoline Sadiron.

The Ideal Sadiron Mfg. Company, Cuyahoga Building, Cleveland, Ohio, is placing on the market the gaso-



The Ideal Self-Heating Gasoline Sadiron, Hand Polished, Nickel Plated.

line self-heating sadiron shown herewith. It is made from highest grade cast iron, hand polished, copper plated and nickel plated. The burner and generator are manufactured under the direction of men who have had long experience in such work. The company states that the device cannot break or get out of repair, and that it is absolutely reliable. When the iron is hot enough to iron linens there is but 3½ lb. pressure on the tank, it is explained, while every tank is tested to stand 175 lb. pressure. Among points enumerated are the following: That there is no needle point; that it is not necessary to throw weight on the iron to compensate for loss of heat, as is necessary with stove heated irons; that there is no odor of gas, as the combustion is perfect; that ironing can be done in cellar, attic, outside the house; that the cost of operating is less than 1 cent per day for a family of five; that there is no danger in its use, and that with ordinary care it will last many years.

B. & L. Bag Holders.

The Brown & Lillard Mfg. Company, Macksburg, Iowa, is making a neat and convenient store fixture in the form of a paper bag holder which is said to be durable, serviceable and of neat appearance. The holder is finish and holds 40 dozen paper bags ranging in sizes from ¼ to 20 lb. When swung from the ceiling above the counter by chains it is within easy reach from either side of the counter, or it can be divided in the center and attached to the wall or shelving.

Remington Solid Breech Hammerless Repeater.

The Remington Arms Company, Ilion, N. Y., and 313-315 Broadway, New York, supplementing the introduction of its autoloading shotgun, rifle and pump gun, has gone a step beyond and adapted the solid breech hammerless principle to the .22 cal. rifle. The main features of this firearm are as follows: In addition to the solid breech hammerless idea mentioned, empty cartridges are ejected at the side upon the operation of the slide. Safety is further assured by the double locked action. The mechanism is simple and there are few working parts. The barrel may be looked through and cleaned from the breech, especially important because the .22 cal. on account of the small bore makes it more difficult to carefully examine the inside of barrel. Owing to the ease with which the user may look through the barrel from the breech every spot can be detected and removed and thus prevent pitting. The take-down is accomplished by simply turning the assembling screw on the left side of the frame. The magazine is a long tube directly beneath the barrel and easily filled from the end, this feature, it is said, being peculiar to the Remington solid breech hammerless .22 cal. rifle. The usefulness of the arm is increased by the fact that it is chambered to shoot equally well without adjustment all of the three popular .22 cal. cartridges, viz.: .22 short, .22 long and .22 long rifle styles. It is made in three grades: No. 1, standard, with round barrel, straight grip walnut stock, weight 4½ lb., especially appealing to boys on account of light weight. No. 2, gallery special, is designed for shooting gallery purposes. Particular care is taken in rifling and sighting to make it thoroughly accurate for fine target work. It is chambered for .22 cal. short only, has octagon steel barrel, pistol grip walnut stock, fitted with steel rifle butt plate and weighs 5½ lb. No. 3, target grade, is adapted for all-around target purposes. It is chambered for .22 short, .22 long and .22 cal. long rifle cartridges, has octagon steel barrel, straight grip walnut stock, fitted with steel rifle butt plate and weighs 5½ lb. Later this grade will also be manufactured and chambered for the .22 W. R. F. cartridge only. Fig. 1 illustrates the rifle as in use, having handsome trim lines and a beautiful finish, Fig. 2 showing on an enlarged scale the working mechanism.

Fig. 1.—Remington Solid Breech, Hammerless Idea Embodied in a New .22 Caliber Repeater.

Fig. 2.—Enlarged View of Interior and Working Parts.

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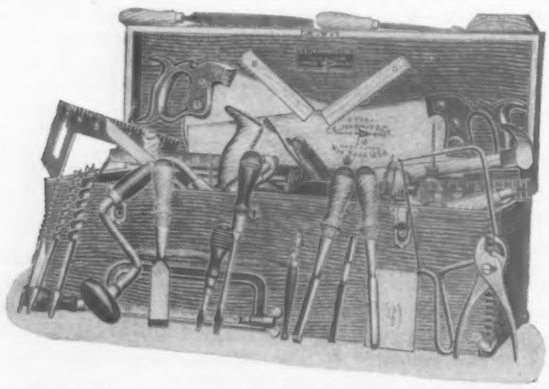
Carpenters' Portable Tool Chests.

C. E. Jennings & Co., 42 Murray street, New York, have added to their comprehensive lines of tool chests for various kinds of workmen, Nos. 1007 and 1008, the



Jennings Tool Chest No. 1008, Containing 41 Warranted Tools.

illustration herewith showing the more complete or No. 1008 style. The outer dimensions of the chest are 26 x 9 x 9 in. and it is made of chestnut wood, varnished natural. There are eight brass corners, two brass suit case catches, mortised lock and leather trunk handle with two brass rings in combination with handle to use in connection with a shoulder strap. The chest contains 1 each rip, cross cut, back and coping saw, 3 auger bits, 2 gimlet bits, 3 chisels, 1 each countersink, screwdriver bit, nickeled ratchet brace, cabinet scraper, nail set, hammer, combination pliers, try and miter square, sliding T bevel, oiler, rule, level, jackplane, marking gauge, glass cutter, 2 each screwdrivers and files and a tool holder with 10 tools, all of which are fully warranted; a total of 41 tools. The No. 1007 very similar, contains 32 warranted tools and is 22 x 7½ x 8 in. in dimensions.

The Standard High Power Automatic and Hand Operated Rifles.

The Standard Arms Company, Wilmington, Del., has just put on the market automatic and hand operated, repeating, hammerless, take-down rifles, shown herewith. These are referred to as of high grade, desirable for both large and small game because of great velocity, long range, flat trajectory, light weight and speed of fire. The solid breech locking mechanism is designed to conserve all the energy of the explosion to impart the greatest possible velocity to the projectile, and the barrel, being rigid with the frame and receiver, insures accuracy at extreme ranges. The company states that six shots may be fired as rapidly or as slowly as the operator pulls the trigger, without removing the rifle from the shoulder and with but very little recoil to disturb the aim; that the action will readily respond to six shots per second, the six empty shells being in the air at the same time in rapid fire, and that the action is so positive and so nearly instantaneous that it is impossible to press the trigger a second time before the reloading is accomplished and the breech bolt is locked. The automatic rifle, Fig. 1, is operated by gas pressure in the following manner: The bullet, moving through the barrel, driven by power of the powder gas, passes over a small port near the muzzle. The port admits a gas pressure, which acts directly upon a piston, causing a rearward motion, which is transmitted through connecting rods to the bolt cams. The rearward motion unlocks the bolt, withdraws and ejects the empty shell, and compresses the action spring. The bullet, passing out of the muzzle, instantly relieves the gas pressure on the piston and permits the action spring to immediately impart a forward motion to the bolt, placing the next cartridge in the chamber and locking and cocking the rifle. The operator has only to maintain his aim and press the trigger until the magazine is empty. If more power is needed to operate the mechanism in cold weather, or because of improper care, it can be supplied almost instantly by adjusting at the gas port, or the power may be cut off entirely by adjustment and the rifle thus converted into an effective hand operated gun. The safety lock prevents a premature discharge, it is pointed out, and it is impossible for the firing pin to reach the primer until the breech bolt is fully locked, and the breech cannot be unlocked automatically until the bullet passes the

Fig. 1.—Standard Automatic, Gas-Operated, Hammerless, Take-Down Rifle, Model H.

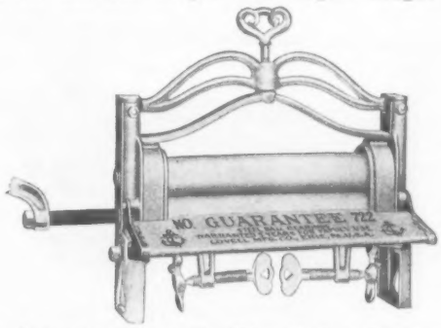
Fig. 2.—Standard Hand-Operated, Hammerless, Take-Down Rifle, Model M.

port and the gas actuates the piston. The operating mechanism is safely housed in the frame and receiver; all rifles are thoroughly tested at the range before leaving the factory, and are fitted with Lyman ivory tip front and sporting rear sights, and holes are provided in the tang for attaching peep sights. The hand operated rifle, Fig. 2, is referred to as the only trombone, or slide action, large caliber rifle on the market. The take-down feature is shown in Fig. 3. No screws are used in assembling the mechanism and the rifles can be readily disassembled for packing in trunk or case, or for cleaning and oiling purposes. After the rifle is taken down all parts remain firmly held in the frame and the receiver. The rifles are now made in .30-.30 cal. and later will be followed by .25-.35, then by .35-.40 and about January 1 the .32 cal.

Fig. 3.—Take-Down Feature of Standard Rifles.

Lovell's Guarantee Wringer No. 722.

The Lovell Mfg. Company, Erie, Pa., is bringing out the iron frame, steel ball bearing wringer shown herewith, the special features of which are that there is no chance for children to get their fingers caught in the

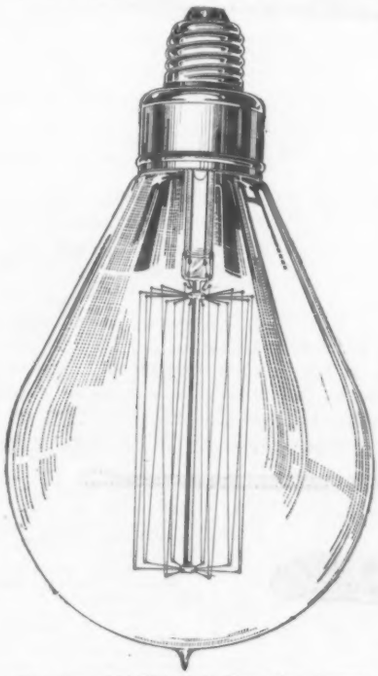


Lovell's Guarantee Wringer No. 722, with Iron Frame and Steel Ball Bearings.

gears, as the cog wheels are covered with shields and the bearings are so arranged that grease cannot work onto the clothes. It is explained that the capacity of this wringer is greater than the company's wood frame inclosed gear ball bearing wringer, put on the market several years ago, because the full length of the rolls are in use; also that on the old style wringer more or less of the grease and oil got on the rolls and soiled the clothes.

The New 200-250 Volt Tungsten Lamps.

The accompanying illustration shows the 200-250 volt Tungsten lamp introduced by the General Electric Company, Schenectady, N. Y. This is a 45-watt lamp; they are also made in 70, 110 and 180 watts. The company explains that the advantages and economy of the Tungsten incandescent over the carbon filament lamp have been practically denied to most circuits operating at 200-250 volts because the regular multiple Tungsten lamps were designed for the standard voltage of 100-125. On these larger voltage circuits—for example, 220 volts—in order to use Tungsten lamps at all it was necessary to operate two 110-volt lamps in series. In response to a



The New 200-250 Volt Tungsten Lamps.

considerable demand for a Tungsten lamp adapted to users' voltage, the company has extended its production of these lamps into voltages from 200-250. This gives to the users of higher voltages the opportunity for the adoption of the economical high efficiency lamps for multiple service. The regular G. E. 200-260 volt carbon filament lamps ranged in efficiency from 3.8 to 3.1 w.p.c. The new Tungsten has the usual Tungsten efficiency of 1¼ w.p.c. The company states that the lamps possess all the excellent qualities of the regular G. E. 100-125 volt Tungsten, including the same form of specially anchored filaments as have the G. E. 100-125 volt lamps. It is pointed out that ample tests of the lamps show exceptionally good results, the average life and performance of the lamps being fully up to that of the standard multiple lamps.

Water Ballast Lawn and Garden Roller.

The face of the drum barrel of the water ballast roller, manufactured by the Wilder-Strong Implement Company, Monroe, Mich., and shown herewith, is made of No. 12 gauge, high carbon steel, into which cold pressed steel heads, or drum ends, of the same thickness are boiler riveted, making the drum water tight. To guard against possible rust the interior of the drum is treated with a pitchy anti-rust preparation. The water inlet used for weighting the roller consists of a ¾-in. hole drilled through one of the cast shoulder hubs, and stopped by a threaded pipe plug. To ballast the roller

Water Ballast Lawn and Garden Roller Which Can Be Weighted to Suit Strength of Operator or Condition of Ground.

it is turned on end, as shown, plug unscrewed, and with garden hose or pail and funnel the drum filled to any desired weight, and the plug replaced. The point is made that the weight is always at the point of contact, where most needed, and that freight charges are less because of greatly decreased weight. The handle of the roller may be passed over the top of the drum, from side to side, making it unnecessary to turn at the end of the lawn. The roller, designated "Water Witch," is neatly painted and striped.

The Silver Fireless Cooker, Made of High Grade Heavy Material with Insulation Hermetically Sealed.

The Silver Fireless Cooker.

The fireless cooker shown herewith is manufactured by Silver & Co., 304 Hewes street, Brooklyn, N. Y. The device is alluded to as made of high grade heavy material, while between the inside and outside shell one of nature's best insulators and heat retainers is said to be used. The insulation is hermetically sealed to prevent its being destroyed by contact with water, steam, &c. The cooker is said to be especially durable, and no effort has been spared to make it rustless.

Pioneer Iron Express Wagon.

The accompanying illustrations relate to iron express wagons manufactured by the Gendron Wheel Company, Toledo, Ohio. The wheels and gears are finished in

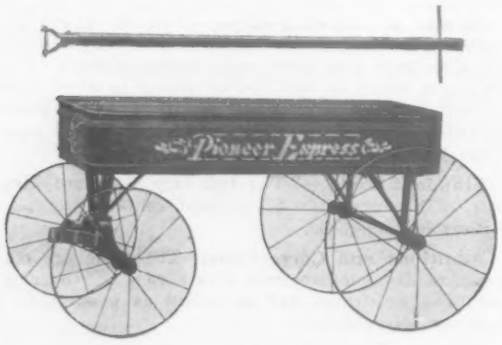


Fig. 1.—Pioneer Iron Express Wagon.

black baked bicycle enamel, which gives a rich appearance and makes the wheels almost noiseless. The front bolster is shown in fig. 2, with reinforced front

Fig. 2.—Pioneer Wagon, Front Bolster, Reinforced Supporting Braces, and Wide Heavy Gauge Steel Rear Brace.

braces, also wide heavy gauge steel rear brace. A brace runs from the axle to the draw iron, and wide heavy stock is used in the draw iron, bridge and bolster. The rear axle, Fig. 3, has two forward extending wide reinforced braces, also wide reinforced upright supports. The bottom board is of selected lumber, joined by tongue and groove and glued, and dressed on both sides. Steel loop handle can be had instead of the regular

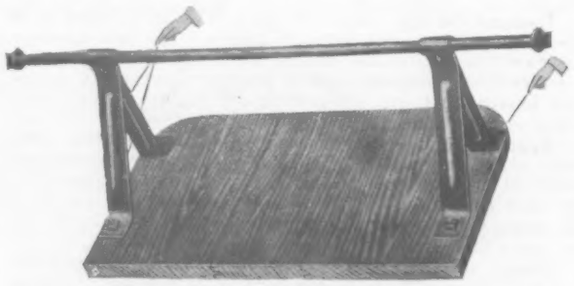


Fig. 3.—Rear Axle with Two Forward Extending Wide Reinforced Braces, and Wide Reinforced Upright Supports.

handle, and seat and shafts can be obtained, if desired. The company refers to the wagon as unusually strong, of the best quality and distinctly different from the every day product.

Simonds Adjustable Key Hole Saw.

The Simonds Mfg. Company, Fitchburg, Mass., and 40 Murray street, New York, has recently placed on the market the Simonds adjustable key hole saw. There are two slots, at right angles with each other in the metal handle, so that by means of a thumb screw on each side and a bearing plate in contact with both the saw may

Simonds Adjustable Keyhole Saw.

instantly be adjusted to and locked at any angle of an entire circle, the heel of the saw blade being slotted for ease in handling. This makes possible the fixing of the blade in any position best suited for close quarters and also for folding so as to occupy the least possible space for carrying about, giving a minimum length of the combined blade and handle of the blade only 9 in. They are packed one dozen in a box.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal. bbl.	lots
Linseed, Western, Raw	.60	@61
State, Raw	.60	@61
City, Raw	.61	@62
Boiled, 1¢ ℔ gal, advance on Raw, Raw, Calcutta, in bbls	.75	@..
Lard, Prime Winter	.90	@..
Extra No. 1	.57	@58
No. 1	.48	@50
Cotton-seed, Crude, f.o.b. mill	4.53	@4.60
Summer, Yellow, prime	5.60	@5.70
Summer, White	6	@ 6¼
Yellow, Winter	5¾	@ 6⅛
Tallow, Acidless	.57	@..
Menhaden, Brown, Strained	.33	@..
Northern, Crude	.24	@..
Southern	.23	@..
Light Strained	.33	@..
Bleached Winter	.36	@..
Extra Bleached Winter	.38	@..
Cocoanut, Ceylon ℔ lb	7.60	@..
Cochin ℔ lb	8.00	@..
Cod, Domestic, Prime	.38	@..
Newfoundland	.40	@..
Red Elaine	.43	@47
Saponified ℔ lb	5¾	@ 6¾
Olive, Yellow	1.35	@..
Neatsfoot, Prime	.55	@56
Palm, Lagos ℔ lb	5⅞	@ 6

Mineral Oils—

	℔ gal.	
Black, 29 gravity, 25@30 cold test	12½	@13
29 gravity, 15 cold test	.13	@13½
Summer	.12	@12½
Cylinder, light filtered	.20	@20½
Dark, filtered	17½	@18
Paraffine, 903-907 sp. gravity	.14	@14½
903 sp. gravity	.13	@13½
883 sp. gravity	10½	@11
Red	.13	@13½

Miscellaneous—

Barytes:		
White, Foreign ℔ ton	$18.50	@20.50
Amer., floated ℔ ton	17.00	@18.00
Off color ℔ ton	12.50	@15.00
Chalk in bulk ℔ ton	3.00	@ 3.40
China Clay, Imported ℔ ton	11.50	@18.00
Cobalt, Oxide ℔ 100 lb	1.45	@ 2.60
Whiting, Commercial ℔ 100 lb	45	@50
Gilders ℔ 100 lb	.52	@ .64
Ex. Gilders ℔ 100 lb	.56	@ .68

Putty, Commercial—℔ 100 lb

In bladders	$1.70	@2.00
In bbls. or tubs, 100 lb	1.20	@1.45
In 1 lb to 5 lb tins	2.65	@3.25
In 12½ to 50 lb tins	1.50	@1.90

Spirits Turpentine—℔ gal.

In Oil bbls	.51	@51½
In Machine bbls	51½	@52

Glue—

	℔ lb	
Cabinet	.12	@15
Common Bone	7½	@ 9
Extra White	.18	@24
Fish, liquid, 50 gal. bbls., per gallon	.60	@1.20
Foot Stock, White	.12	@14
Foot Stock, Brown	.9	@11
German Common Hide	.10	@12
German Hide	.12	@18
French	.10	@40
Irish	.13	@16
Low Grade	.10	@12
Medium White	.14	@19

Gum Shellac—

	℔ lb	
Bleached, Commercial	.16	@16½
Bone Dry	.20	@21
Button	.20	@30
Diamond I	.25	@26
Fine Orange	.20	@21
A. C. Garnet	16½	@17
Light Orange	.17	@19
Kala Button	.10	@11
D. C.	.25	@26
Octagon B	.22	@23
T. N.	15½	@16
V. S. O.	.23	@25

Colors in Oil—

	℔ lb	
Black, Lampblack	.12	@14
Blue, Chinese	.36	@46
Blue, Prussian	.32	@36
Blue, Ultramarine	.13	@16
Brown, Vandyke	.11	@14
Green, Chrome	.12	@16
Green, Paris		@24
Sienna, Raw	.12	@15
Sienna, Burnt	.13	@15
Umber, Raw	.11	@14
Umber, Burnt	.11	@14

White and Red, Lead &c.—

	℔ lb
Lead, English white, in Oil—10½@10⅝	
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7¾
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¾
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7⅞
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	5¼@ 5⅝
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7¼@ 7⅜
Green Seal	7⅜@ 8
White Seal	8⅜@ 9
French, Red Seal	8⅝@ 8⅞
Green Seal	10⅜@10⅝

Dry Colors—

	℔ lb	
Black, Carbon	.5	@10
Black Drop, American	3½	@ 8
Black Drop, English	.5	@15
Black, Ivory	.16	@20
Lamp, commercial	.3	@ 5
Blue, Celestial	.4	@ 6
Blue, Chinese	.30	@31
Blue, Prussian, Domestic	.28	@30
Blue, Ultramarine	.5	@15
Brown, Spanish	⅛	@ 1
Carmine, No. 40	2.65	@2.75
Green, Chrome, ordinary	3½	@ 5
Green, Chrome, pure	.17	@25

Metallic Paint, ℔ ton,

Brown	$16.50@$22.00
Red	$14.00@$18.00

Ocher, American ℔ ton	$12.00	@15.00
American Golden	4	@ 5
French	1¼	@ 2
Foreign Golden	3	@ 4
Orange Mineral, English	10	@12
French	12¾	@13
German	12	@13
American	8½	@10
Red, Indian, English	5	@ 7
American	3	@ 3½
Red, Turkey, English	4	@10
Red, Tuscan, English	7	@10
Red, Venetian, Amer. ℔ 100 lb	$0.75	@1.50
English ℔ 100 lb	$1.15	@1.60
Sienna, Italian, Burnt and Powdered	.3	@ 9
Italian, Raw, Powdered	.3	@ 7
American, Raw	2¼	@ 3
American Burnt and Pow'd	.2¼	@ 3
Talc, French ℔ ton	$18.00	@25.00
American ℔ ton	15.00	@25.00
Terra Alba, French ℔ 100 lb	.80	@1.00
English ℔ 100 lb	.90	@1.00
American ℔ 100 lb, No. 1	.75	@ .80
American ℔ 100 lb, No. 2	.60	@ .65
Umber, Turkey, Bnt. & Pow.	2½	@ 3
Turkey, Raw and Powdered	2½	@ 3
Burnt, American	2	@ 2½
Raw, American	2	@ 2½
Yellow Chrome, Pure	12¼	@13
Oxide Red, American	2	@ 7½
Vermilion, English, Imported, 60@70		
Chinese	$0.90	@1.00

Current Hardware Prices.

General Goods.—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists," 218 pages, price $2, prepaid, contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓&5%
North's 10%
Upson's Patent, ₩ gro., $29.90.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....10%
Ives' Stop Bead Screws and Washers 10%
Taplin's Perfection.....10%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₩ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₩ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils .....₩ lb @9 ¢
Hay-Budden, Wrought.....9½@9¾ ¢
Trenton .....₩ lb 9½@9¾ ¢

Imported—

Swedish Solid Steel Paragon, ₩ lb .....10@10½ ¢
Swedish Solid Steel Sisco, Superior, ₩ lb.....10@10½ ¢
Peter Wright & Sons, ₩ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½ ¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....30%
Jennings' Pats., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jenninga' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Snell's Star Auger Bits.....50&10%
Swan's .....65&10&5%
Swan's, Jennings' Pattern.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₩ doz., $28; No. 2, $18.....60&10%
Ford's, Clark's Pattern...60&5@60&10%
C. E. Jennings & Co., Steer's Pat...25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dbl. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....20&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered..gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@1.1¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Rocket..gro.$11.50@12.00
Elmore Tool Mfg. Co.:
Tinners' and Brad Awls.....55&7%
Scratch Awls.....60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—*Iron or Steel.*

Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar.....4½&5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style..4¼@4¾¢
No. 2 Solid Collar.....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12.....70%
Nos. 13 to 14.....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—

Common and Concord, not turned .....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50&10%
Pullman .....50&10%

Spring—

Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—

No. 10 Ideal, Nickel Plate..₩ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₩ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₩ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₩ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3 Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.90; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $8.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$500*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—

Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Net Prices.

Bells—Cow—

Wrought Cow Bells.....75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....60@60&10%
White Metal.....60@60&10%
Nickel Plated.....50&10%
Swiss .....50&10%
Coue's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&10%

Belting—Leather—

First Quality, Ex. Hy., Strictly Short Lap.....60&10%
Standard .....70&10@70&10&5%
Light Double.....75&10%
Cut Leather Lacing.....45@50%
Leather Lacing Sides, per sq. ft.25¢

Rubber—

Competition (Low Grade), 70&10@75%
Standard .....60&10@70%
Best Grades.....40&50%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1909 list:
Chain, Parts, Spokes.....30%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden.....75@75&10%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....55%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓&10%

Bolts

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ x 6 and smaller.....75&10%
Larger and longer.....70&10%
Common Carriage (rolled thread). ⅜ x 6, smaller and shorter, 75&10&5%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends, with C. & T. Nuts, 70&10%
Machine (Cut Thread): ⅜ x 4 and smaller....75&10&5%
Larger and longer....70&10&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch ...	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&50@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10@80%
Ives' Mortise.....10%
Ives' Wrought Metal.....10%

Expansion—

F. H. Evans' Crescent.....40@60%
Richards Mfg. Co.....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type..60&10&5&2½%
Star, Wood Screw Type.....10%
Star, Machine, Single Wedge.60@10%
Star, Machine, Double Wedge..60@10%
Steward & Roman Mfg. Co.:
Style No. 13, Double.....60@10%
Style No. 1, Single.....60@10%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw.....66⅔%

Plow and Stove—

Plow .....65&5@70%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84. 82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84..82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch.....			*2¼*	*2½*
Per doz.....			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball.....$1.50@$1.75
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 61, 166, 206, 614.....50%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—

Wrought Steel.....80@80&5%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Stanley's Pressed Steel.....80%
Stanley's Folding Brackets..70&10&5%
Taplin Victor Handy Egg Beater Bracket .....₩ doz. $1.50

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'r's list, price per gross, subject to discount of 10&7½&5&5 &10&5%.

Quart.....	*10*	*12*	*14*
Water, Light....	*$28.35*	*30.75*	*34.75*
Water, Ex. Heavy	*46.85*	*49.35*	*53.25*
Fire, Rd. Btm...	*33.50*	*35.90*	*39.90*
Well	*37.35*	*41.35*	*45.35*

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought 65%
Cast Brass, Trebout's.....40&10%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

BRIGHT.
Light Narrow, Light Reversible .....75&5%
Reversible and Broad,75&10%
Loose Joint, Narrow, Light Inside Blind, &c.....75%
Back Flaps, Table Chest.70%

BRONZED.
Light Narrow, Loose Pin..55%
Light, Loose Pin, Ball Tip.65%
Broad 55%

Extra, 5 @ —

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800....30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel.....4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps— Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M..$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$190
B. B. Caps, Round Ball.....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets..15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....65&10@70%
Plate .....60@60&5%
Philadelphia .....70&10@75%
Acme, Ball Bearing.....35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem (Roller Bearing).....70%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list...40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:					
3-16	*¼*	*5-16*	*⅜*	*½*	*⅝*
$7.45	*4.80*	*3.85*	*3.25*	*3.10*	*3.00*

¾-7/8-1. 1⅛ to 1¼ inch.
$2.90 3.00

German Coil.....70&5%
German Pattern Coil:
6-9 to 1.....70&10&5%
2 and 3.....60&10&10@70%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97.....70&5%
Covert Mfg. Co.:
Halter .....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr. 6½—6-3, Straight, with ring..$26.00
6½—6-2, Straight, with ring..$27.00
6½—8-2, Straight, with ring..$30.00
6½—10-2, Str'ght, with ring..$35.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c: No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....70&10@—%

Miscellaneous—

Jack Chain:
Iron .....60&10&5@60&10&10%
Brass 65%
Safety and Plumbers' Chain..75%
Gal. Pump Chain....lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil.35&2½@40%
Triumph Dog.....50&10@60%
Brown Halter and Coil.....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains .....35&2½@40%
Niagara Dog Leads and Kennel Chains .....45@50&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain....70%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered .....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft. .....$2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk—

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 50@55¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro.....$54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—Socket Framing and Firmer

Standard List..80&10@80&10&10%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's .....66⅔@70%
L. & I. J. White & Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold— lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary.... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels.....50&5%

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat. each $8.00.....35&5%
Blacksmiths' 25%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible.....35%
Empire 25%
Jacobs' Drill Chucks.....35%
Morrow Ball Bearing Drill Chucks..35%
Pratt's Positive Drive.....25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws.....35%
Universal, Com. Style Jaws.....40%
Combination, Reversible Jaws....35%
Combination, Com. Style Jaws....40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks.....25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ...25%
Positive Drive.....40%
Planer Chucks.....20%
Standard 45%
Drill Press Vises.....30%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combinations, Nos. 83 and 84 .....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72 .....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%
Whitaker Mfg. Co.:
National Drill.....25%

Clamps—

Carriage Makers', Star, P., S. & W. Co. 50%
Besly, Parallel.....33⅓&10%
Hammer & Co.:
Adjustable .....20&5%
Carriage Makers' H. P. Screw.40&5%
Myers' Hay Rack.....50%
Lineman's Swedish Neverturn.....60%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

American Fork & Hoe Co.:
Star, ₱ doz., Socket, $4.00; Shank $3.50
Shank, ₱ doz., X 7½, $3.50; Shank, X 8.....$3.75

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each....$5.00
Lightning Belt Horse, each..$15.00
Chicago Belt Horse, each. $20.00
Stewart's Enclosed Gear Ball Bearing Horse, each.....$7.50
Stewart's New Model Sheep Shearing Machine, each..$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25%

Clips, Axle—

Regular Styles.....80&80&10%

Cloth and Netting, wire —See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs.....70%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods.....75@75&5%

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	*Charcoal. Copper.*
Northeastern:		
70&10&1—%	*50&10&7½%*	*50&10%*
Eastern:		
75&1—%	*50&10&7½%*	*50&10%*
Central:		
75&1—%	*60%*	*50&10%*
Northwestern:		
75&1—%	*60%*	*50&10%*
Western:		
70&10&1—%	*50&12½%*	*50&5%*
Tennessee:		
70&10&1—%	*50&12½%*	*50&10%*
Southern:		
70&10&1—%	*50&12½%*	*50&5%*
Southwestern:		
70&1—%	*50&5%*	*50&5%*

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21½¢; lighter than 3 lb. to pair.....23½¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted..18@20¢
Patent Russia.....lb....20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted...lb.13@14¢
Patent India, Twisted..lb...17¢
Pearl Braided, cotton, No. 6, ₱ lb, 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10.....₱ lb 23¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ₱ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White...₱ lb 40¢
Massachusetts, Drab....₱ lb 45¢
Phoenix, White, Nos 8 to 12....27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90@—%
Short Length.....90&20@—%
Hendryx Standard Wire Picture Cord .....90&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ₱ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00
Suremark, Black, $2.25; Blue, Red and Yellow $2.50

Crooks, Shepperds'—

American Fork & Hoe Co.:
Montana .....₱ doz. $4.50

Crow Bars—See *Bars, Crow.*

Cultivators—

American Fork & Hoe Co.:
Victor Garden.....50&10%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....60%
B. Mfg. Co.....40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Ideal .....40@40&5%
Hales .....60&5%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$18.00	$44.00	$72.00	$60.00

New Triumph No. 605, ₱ doz. $24.00.....40%
Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $12.00.....45&10&10%
$15.00 $18.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater .....₱ doz. $4.00

Tobacco—

Enterprise .....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18 .....40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ₱ doz., $24.00.....25%
Samson, ₱ doz., $34.00.....25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz. $8.50
Split Handle Post Hole Diggers, ₱ doz., $7.50
Hercules Pattern, ₱ doz.....$9.50
Kohler's, ₱ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines .....$1.50@1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....33⅓
C. & C., Ratchet.....25%
Reversible Ratchet Die Stocks....25%
Goodell Automatic Drills.50&10&60&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16.
Millers Falls Automatic Drills,33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved .....40@40&5%
Ratchet, No. 012.....40@40&5%
Ratchet, Celebrated.....40@40&5%
Ratchet, Whitney's, P., S. & W.....40&10@50%
Star Drills .....50&10%
Star Pipe Drills.....50%
Star Drill Holders.....50&10&10%
Star Drill Points.....50&10&10%
Whitney's Adjustable, No. 10, $12.00, 33⅓%

Twist Drills—

Bit Stock.....70@70&10%
Taper and Straight Shank, 65@65&10%

Drivers, Screw—

Screw Diver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 .....50%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible .....55&7%
Standard Neverturn.....60%
Star .....75&5%
Screw Driver Bits.....25%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, ₱ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540 .....40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern..	*75&10&5%*	*50&10%*
Eastern.....	*80%*	*50&10%*
Central.....	*80&10&5%*	*50&10%*
Northwestern..	*80&10&5%*	*50&10%*
Western	*80&5%*	*50&5%*
Tennessee.....	*80&5%*	*50&10%*
Southern.....	*75&10%*	*50&5%*
Southwestern..	*75&10&2½%*	*50&5%*

Terms,—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

	Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4	*80%*
Sizes 1½, 2½, 3½, 5, 6	*60&10%*
No. 26	*50%*
No. 24	*25%*
Copper Elbows	*50%*

Elbows, Stove Pipe—

Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, Flat Crimp..40&10&5%

Emery, Turkish—

	4 to 4/6:	*5½ to 220:*	*Flour.*
Kegs .....lb.	*5 ¢*	*5½¢*	*3½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢*	*3¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢*	*4 ¢*

10-lb. cans, 10 in case	6½¢	7 ¢	6 ¢	
10-lb. cans, less than 10	10 ¢	10 ¢	8 ¢	
Less quantity	10 ¢	10 ¢	8 ¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, Lemon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₱ gro., $1.08.....10%
Titan, ₱ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ₱ doz., $36.00.....40&10%
Lane's, ₱ doz., $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

Peck, Stow & Wilcox Co.:

In.....	15	17	19	21	24
	$4.00	4.40	4.75	5.50	6.50....30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:
Iowa Dig-Ezy Potato.....70&5%
Hay, Regular, 3-tine....45&20&12½%
Hay, Regular, 4-tine.....60&7½&5%
Champion, Hay.....60&12½%
Acme, Hay.....60&20%
Manure, Regular, 4-tine.....65&5%
Manure, Regular, 5 and 6 tine...70%
Champion, Manure.....65&5%
Columbia, Manure.....70%
Acme, 4-tine.....60&10&5%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....65%
Wood, Barley.....35&5%
Steel, Barley.....65%
Columbia, Spading.....70&7½&5%

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.....	*1*	*2*	*3*	*4*	*6*
Each....	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P. S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.00; 2, $1.30
Nail, Wood Handled, No. 1, $2.50; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 50%

Grease, Axle—
Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₱ doz., 1 lb. $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand and Foot Power, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....33⅓%
Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 .....40%
Disc Grinders, each, $2.50.....40%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....23⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10@—%
Bridgeport Chain Co.:
Triumph Coil and Halters,35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayatte R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₱ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢..80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—
Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz...45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle..... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
} 50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₱ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj, Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B, D, No. 17, $1.25; F, D, No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B, D, No. 20.....50&10%
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.75&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B, Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₱ doz. 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%
} Extra 5@10% often given.

Hangers— Garment—
Pullman Trouser, ₱ gro. No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.01
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind; Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tches.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.25*	*1.90*	*3.50*
Latches only	*.70*	*.75*	*.35*

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₱ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co. Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....₱ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₱ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%
} Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c.:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
} *Extra, 5@—*

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
3, to 1 inch.....lb. 6¾¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 182.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes—Eye—
Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60&5%

Handled—
Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50
American Fork & Hoe Co.:
Regular, Cotton.....75&10&5&2½%
Crescent, Cultivator.....75&2½%
Mattock, Senior.....70%
Mattock, Junior.....70%
Sprouting.....50%
Tobacco, Harper's.....66⅔&15&10%
Warren.....55&10&10&5%
Ivanhoe.....65&15&10%
Cultivator, B B 6.....70&10&10&5%
Cultivator, B B 6½.....70&10&10&5%
Weeding, Acme.....72½&10&2½%
Scuffle, Lightning.....60&5%

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders—Bit—
Angular, ₱ doz., $21.00.....45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze.....50%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—
Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz.....$2.00

Trace and Rein—
Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—
Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling..75&10@80%
Columbian Hdw. Co., Gem.....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons—Sad—
From 4 to 10.....lb. 2½@2¾¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Caps	86	93	96	98
Tin'd Caps	.91	88	1.01	98

Bar and Corner—
Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Irons, Soldering
See *Coppers.*

Jacks, Wagons—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....50&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....35%

Ladder—
Richards Mfg. Co., Ladder Jacks..50%

Jointers—
Pike Mfg. Co., Saw Jointers, $7.00..40%

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—
Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
American Fork & Hoe Co.:
Easy Cut, ₱ doz No. 10 C H...$2.10
Easy Cut, ₱ doz., No. 10 B C H..$2.20
Acme, ₱ doz.....$2.35
Dent, ₱ doz.....$2.35
Adjustable, Serrated, ₱ doz.....$1.90
Serrated, ₱ doz.....$1.85
Yankee, No. 1 C H.....$1.35
Yankee, No. 2 C H.....$1.15

Drawing—
Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—
Farriers'.....doz. $2.60@3.55
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2¼-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—
See *Belting, Leather*

Ladders, Store, &c.—
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co., Melting and Plumbers'.....25%
P. S. & W.....40&10%
Reading.....60%

Lamps,—
Hammer's M. I. Hand.....45%

Lanterns—Tubular—
Regular, No. 0....doz. $4.00@4.50
Side Lift, No. 0....doz. $4.25@4.75
Hinge Globe, No. 0. doz. $4.25@4.75
Other Styles.....40&5%

Bull's Eye Police—
3-inch.....$3.75@4.00

Latches—Thumb—
Roggin's Latches, Jap'd, with Screws.....doz. 35@40¢

Door—
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—
Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—
See *Pumps—*

Lifters, Transom—
R. & E.....10%

Lines—
Wire Clothes, Nos. 18 19 20
100 feet.....$2.30 1.95 1.75
75 feet.....$1.95 1.65 1.50
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—
Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Crescent.....10%
Automatic Gravity Metal Sash, ₱ gro., $149.58.....10%
Window Ventilating.....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%
Taylor Mfg. Co., Perfect Ventilating, ₱ doz.....$0.75@$1.00

Machines—Boring—
Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—
Reisinger Invincible Hand Power... ₱ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—
Chandler's.....12½%

Washing
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$30.60
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—
Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—
Swett Iron Works.....50%

Mats, Door—
Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%
Everlasting Flexible Steel.....33⅓%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.:
Coffee.....20@25%
Shell and Corn.....25&10%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—
Divine's Red Devil.....30%
$2.50 3.50 10.00 15.00.....33⅓%
No. 1. 2 3 4
Lippincott's:
No..... 1 2 3 4
$2.50 3.50 10.00 15.00..33⅓%
Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing. 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%

Nails—
Wire Nails and Brads, Miscellaneous.....85&5@85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	19	.. ₱ lb. net, 12¢
Coleman	13	12	12	11	11	net ₱ lb
New Haven	23	21	20	19	19	.. ₱ lb. net, 12¢
Livingston	19	18	17	16	16	.....10%
Western						₱ lb 8½¢

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd. gro.	.45	.55	.60	.70
Por. Head, gro.	1.10	1.10	1.10	

Upholsters—
Brass.....80%
Plated.....80&10%

Nippers—
See *Pliers and Nippers.*

Nipples—
Standard Nipple Co.:
Wrought Pipe Nipples.....80%

Nuts—*Blank or Tapped.*

	Off list.
Cold Punched:	
Square	5.40¢
Hexagon	6.00¢
Square, C., T. & R.	5.80¢
Hexagon, C., T. & R.	6.60¢
Hot Pressed:	Off list.
Square	5.90¢
Hexagon	6.40¢

Oakum—
Best.....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy.....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—
Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—
Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10@70%
Railroad.....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70&70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Packing Box—
Herculever, ₱ doz., $24.....30%

Can Openers—
Can and Bottle Openers, ₱ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty.....$0.75

Egg—
Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope, any quantity.....13¢

Rubber—
(Fair quality goods.)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@15¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—
American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute.....lb. 4@4¼¢
Russia Packing.....lb. 9@10¢

Pails, Water, Well, &c.—
See *Buckets.*

Paint—
Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans—Dripping—
Standard List.....75&10@80%
Edwards, Royal Blue.....75%

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper
Asbestos Paper, ton $37.50@$40.00
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft..2¼¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....2½¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, $3@$4
Medium weight, 30 lbs. to roll, $5@$7
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....$54.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—
1 ply (roll 400 sq. ft.), ton, $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—
Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—
Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $30.00
Livingston Nail Co.:
Daisy.....₱ doz. $4.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Orange—
Goodell Co., Success.....each $20.00

Potato—
Saratoga .....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—
List .....75&10%
Cronk's Handled Garden Mattock, ₱ doz., $3.00.....33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron .....60@60&10%

Pipe, Cast Iron Soil—
Eastern Prices:
Standard, 2-6 in......68%
Extra Heavy, 2-6 in.....7½%
Fittings, Standard and Heavy 80¾%
Extra, 10 & 10&5%

Pipe, Merchant—
Carloads to Consumers:

	Steel. Blk. %	Steel. Galv. %	Iron. Blk. %	Iron. Galv. %
⅛ and ¼ in..				
⅜ in.....				
½ in.....				
¾ to 6 in....				
7 to 12 in....				

See Trade Report

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 85%
Second-class 87%

Pipe, Stove—

Edwards' Nested:	Per 100 joints. C. L.	L. C. L.
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$5.90	$6.90
6 in., Uniform Color..	6.40	7.40
7 in., Uniform Color..	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&5%
Bench, second qual....40@40&5%
Molding .....25@25&5%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....60%
Union 60%

Plane Irons—
Wood Bench Plane Irons....25%
Buck Bros.'.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....₱ doz. $7.50

Plates—
Felloe .....lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1⅛-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break .....75&10%

Pliers and Nippers
Button Pliers....75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45, $1.50.
Gas pipe.. 7 $2.00, 8 $2.25, 10 $2.75, 12-in. $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....60%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers.....70%
Wire and Cutting Pliers.....75%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston & Sons:
Shafting Levels .....60&10%
Pocket Levels.....60&10%
Plumbs and Levels.....60&10%
Track Level and Gauge.....60&10%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers....lb. 9 ¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10 ¢

Police Goods—
Manufacturers' Lists..25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ₱ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ₱ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $5.50..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 3 oz. cans, ₱ doz., $1.25.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside .....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese .....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2 gal pails, ₱ doz., $24.00; each, $2.50; 1 lb cans, each .....75¢
Glasbright Powder, bbls., ₱ lb..20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square..doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro.$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned .....50&10%

Powder—
Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
Discount to the trade, 10%.
NOTE.—Prices vary according to territory.
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)..	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ₱ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers.....10%
Nail Pullers.....40%
Miller's Falls, No. 3, ₱ doz., $12.00.. 33¼&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack, ₱ doz.....$0.40

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz..	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz....	$0.16	.19	.23 .30
Inch	1¾	2	2¼ 2½
Side, doz.....	$0.25	.40	.55 .60
Inch	1¼	1¾	2 2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in. .....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. .20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle, ₱ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in. .....27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ₱ doz.....19¢
Common Sense.....₱ doz. 20¢
Merit, ₱ doz., 2¼ in.....37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in, ...20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&10&5@80
Wood Pumps, Tubing, &c....50%
Barnes Mfg. Co.:
Dbl. Acting (low list).....50%
Pitcher Spout.....80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $6.50
Flint & Walling Mfg. Co.:
Fast Mail Hand and Fast Mail (low list).....50&5%
Tight Top Pitcher.....80%
Goulds Mfg. Co.:
Double-Acting Thresher Tank.. $5.00
Diaphragm No. 3, Side Suction.$14.50
Empire, Advance, Seneca, D. A. Shallow and Deep Well (low list) 50%
Spraying and Whitewashing.....$2.45
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
F. E. Myers & Bros.:
Pumps (low list), Power Pumps, Spray Pumps.....50%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch....	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

30@30&5%

Punches—
Saddlers' or Drive, good, doz.50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Elmore Tool Mfg. Co.:
Machinists' Center.....40%
Tinners': Solid, 50%; Prick.....50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2¼@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 30¢.....30%
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft.....$3.45
O. N. T., ₱ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1⅛ in., $4.00.
Standard, 1¼ in.....₱ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
Trolley, No. 301, ₱ ft.....9¢
McKinney's:
Hinged Hanger Track, ₱ ft., 11¢ 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 30.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
American Fork & Hoe Co.:
Lawn, ₱ doz., No. 24, $2.50; No. 20 .....$2.25
Cronk's:
Steel Garden: Champion, ₱ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ₱ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ₱ doz., 20 teeth, $2.25; 24, $3.00.....net
Anticlog Lawn, ₱ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Jumbo Lawn, 36-tooth....₱ doz. $5.00
Lawn Queen, 20-tooth....₱ doz. $2.85
Lawn Queen, 24-tooth....₱ doz. $3.00
Paragon, 20-tooth.....₱ doz. $2.65
Paragon, 24-tooth.....₱ doz. $2.75
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
John Engstrom Swedish.....65%
Sharp Shaver.....60%
Fox Razors, ₱ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. Dis. 50%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo.. Nickeled Populo.....20%
Aluminum, German Silv., Bronze,25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P, 33¼%; 2904 PN., 33⅓%; 0624 N, 33⅓%; 02081 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%; 986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal.40%

Revolvers—
Single Action.....$5¢@$1.00
Double Action, except 44 cal.$2.00
Double Action, 44 caliber...$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz.85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz.65@70¢

Rivets—
Copper Rivets and Burrs, 50@50&10%
Tinners' and Miscellaneous Rivets .....80@80&10%

Bifurcated and Tubular—
Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@65¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Highest Grade.....lb. 8¼@8½¢ Lower Grades.
Sisal, 7-16 in. diam. and larger: Highest Grade.....lb. 7½@7¾¢ Commercial Grade.....lb. 6½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure .....lb. 7¾@8¢
Sisal, Tarred, Medium Lath Yarn: Pure .....lb. 6¾@7¢
Cotton Rope: Best, ¼-in. and larger.16½@20¢ Medium, ¼-in. and larger.15@16¢ Common, ¼-in. and larger..7½¢ In coils, ½¢ advance.
Jute Rope: Rove, No. 1, ¼-in. and up. lb. .....5@5½¢

Wire Rope—
Galvanized .....47½&2½%
Plain .....55&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60&5%
Ivory .....25&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25&25&10%
Miscellaneous .....50&50&10%
Stephens' Combination.....55%
Stationers' .....50&50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 50%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1⅜ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 40%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Hand Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, ... 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wag- ...

Scrapers—

Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80&5%
Coach, Gimlet Point ..... 80&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—
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Flat Head, Iron ..... 87½&5@..%
Round Head, Iron ..... 85&5@..%
Flat Head, Brass ..... 80&5@..%
Round Head, Brass ..... 77½&5@..%
Flat Head, Bronze ..... 75&5@..%
Round Head, Bronze ..... 72½&5@..%
Drive Screws ..... 87½&5@..%

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Plain Grass, Cutting Edge Polished ..... $6.25@$6.50
Clipper, Bronzed Web ..... $6.50@$6.75
Solid Steel, Web and Backs Polished ..... $7.00@$7.25
Bush, Weed and Bramble, Painted ..... $6.50@$6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@$8.50
Clipper Grain, Bronze Web. $8.50@$8.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—

American Fork & Hoe Co.:
Rake, Shovel and Hoe, ℔ 1oz. sets, No. 3 P F $2.25

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut ..... ℔ doz. $7.50
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.00
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Royal, Hand ..... ℔ doz. $4.50
Seymour Smith & Son's 65%
Taintor Positive ..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} 50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Seymour Smith & Son's 30%

Shears—

Cast Iron	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel ..... 60&10&5%
Tailors' Shears ..... 40&10&10%
Acme Cast Shears ..... 40@40&5%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel ..... 50&10&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips ..... 40@45&5%
W. H. Compton Shear Co., Forged Steel Handles 35%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel 50%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners ..... 75&10%
Wood Handle Pruning Shears 40%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.05	$5.05
Dixie, 10 x 14 in.	4.25	5.45
Dixie, 7 x 10 in.	5.25	6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—
25-lb. bag.

Drop, up to B $1.70
Drop, B and larger 1.95
Buck 1.95
Chilled 1.95
Dust 2.30

Shovels and Spades—

Association List ..... 40&7½@40&10%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $2.50@$2.75
Wood and Mall, D Handle, $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro $12.00

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz. $39.00

Sieves, Seamless Metallic
Per dozen.

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.20	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list 60%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—
Factory Shipments.

"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless, 60&7 tens.
Victor A, Noiseless ..... 60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Grass Scythe ..... 50@50&5%

Snips, Tinners—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50¢@55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ℔ gro. ..... 50¢@55¢
Table Spoons, ℔ gro. ..... $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ℔ doz. $1.00

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45¢@47¢
1½ x 3 x 28 .... per pair. 68¢@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00
Enterprise ..... 25@30%
Hero Fruit Jar Co., ℔ doz. $1.50
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..... List Jan. 5, 1900.
Steel and Iron ..... 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ℔ gro. $9.00

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $1.80;
Galvanized $2.10
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list: ℔
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 80¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
} 33⅓%

India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks 40%
Hindostan No. 1, R'g'lar. ℔ 8¢
Hindostan No. 1, Small ..... ℔ 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ℔ 20¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 10¢
Sand Stone ..... 6¢
} 33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.50
Green Mountain S. S. ℔ gro. $7.00
Extra Indian Pond S. S. ℔ gro. $8.00
No. 1 Indian Pond S. S. ℔ gro. $7.50
No. 2 Indian Pond S. S. ℔ gro. $5.00
Leader Red End S. S. ℔ gro. $5.00
Quick Cut Emery.... ℔ gro. $10.00
Pure Corundum..... ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ℔ gro., $12.00 $12.00 ..... 33⅓%
Lightning (Artificial), ℔ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ℔ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ℔ doz., No. 1, $10.00.... 50%
Morrill's, No. 2, $12.50..... 50%
Seymour Smith & Son's..... 60%

Door—

Chapin-Stephens Co..... 50@50&10%

Plane—

Chapin-Stevens Co..... 20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stretchers, Carpet—

Excelsior Stretcher and Tack Hammer Combined, ℔ doz., $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Goshen Sweeper Co.:	Per doz.
Gilt Edge	$27.00
Superfine	26.00
Majestic	24.00
Select, Nickeled	22.00
National Sweeper Co.:	
National Queen, Nickeled	$27.00
Martha Washington, Nickeled	25.00
Monarch, Japanned	20.00
Perpetual, Japanned	18.00
Streator Metal Stamping Co.:	
Model E, Sanitaire	$25.00
Eureka	15.00
Streator Majestic, Nickeled	24.00
Streator Conqueror, Japanned	22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: 50c per dozen on three-dozen lots: $1 per dozen on five-dozen lots, $2 per dozen on ten-dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.90&25@—%
American Cut Tacks..90&25@—%
Swedes' Cut Tacks..90&30@—%
Swedes' Upholsterers'.90&35@—%
Gimp Tacks.....90&35@—%
Lace Tacks.....90&35@—%
Trimmers' Tacks.....90&30@—%
Looking Glass Tacks.....65@—%
Bill Posters' and Railroad Tacks, 90&40@—%
Hungarian Nails.....80@—%
Finishing Nails.....70@—%
Trunk and Clout Nails.75&5@—%
NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&5 tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:		
Gal.	Gasoline	Oil
50	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin....50@—%
Patent Leather.....25@30&5%
Steel .....33⅓&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@ 35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather...25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lb.....$2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@35%

Ties, Bale—Steel Wire—

Single Loop.....82½&10%
Monitor, Cross Head, &c.70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools..... 50%

Ice Tools—

Gifford-Wood Co..... 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simond's Improved..... 33⅓%
Simonds' Crescent..... 30%

Ship—

L. & I. J. White..... 25%

Torches—

Hammers, Engine, ℔ doz..... $4.50

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro.$13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse ..... 50&5%
Hawley & Norton..... 65&10%
Victor ..... 75@75&10%
Oneida Community Jump..... 70&5%
Stop Thief..... 60%
Tree Trap..... 60%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. .85@90¢
Marty French Rat and Mouse Traps (Genuine), ℔ doz.:

	Crate lots.	Small lots.
No. 1, Rat.....	$11.50	$14.50
No. 3, Rat.....	$5.75	$6.50
No. 3½, Rat.....	$4.70	$5.25
No. 5, Mouse.....	$2.25	$3.00

Animal Trap Co.:
Out o' Sight, Mouse, ℔ doz.....$0.60
Out o' Sight, Rat, ℔ doz..... 1.20
Easy Set, Mouse, ℔ doz..... .35
Easy Set, Rat, ℔ doz..... .85
Out o' Sight Chockers, ℔ doz. holes ..... .12
Out o' Sight, Tin, 5-hole, ℔ doz. traps ..... .75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in bulk, net ℔ gro. $5.50
In 1 doz. boxes..... ℔ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & I. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ℔ doz. $16.00
Grocery ..... ℔ doz $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ℔ doz $18.50

Tubs, Wash—

No. 0 1 2 3
M'fr's list, price per gross, subject to discount of 10&7½&5&5 &10&5%.
Galvanized..... $67 $79 $91 $103

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls .21@23¢
No. 12, ¼ and ½-lb. Balls .19@21¢
No. 18, ¼ and ½-lb. Balls .16@18¢
No. 24, ¼ and ½ -lb. Balls. 15½@17½¢
No. 36, ¼ and ½-lb. Balls .15@17¢
Chalk Line, Cotton ½-lb. Balls .....24@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8½@21¢
Cotton Wrapping, 5 Balls to lb., according to quality..13½@21¢
American 2-Ply Hemp, ½ and ½-lb. Balls.....12½@15¢
American 3-Ply Hemp, 1-lb Balls .....13½@16¢
India, 2-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine)...7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8½¢
2, 3, 4 and 5-Ply Jute, 1-lb. Balls .....9@11¢
Mason Line, Linen, ½-lb. Bls.17¢
No. 264 Mattress, ¼ and ½ lb. Balls, according to quality. 30@60¢
Wool, 3 to 6 ply....B 6¢; A 7½¢

Vises—

Solid Box.....60@60&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., Slide ..... 40&5%
Fisher & Norris Double Screw, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00..... 15&10%
Fisher-Brooks Bench Vises, No. 0, $3.80; No. 1, $5.00; No. 2, $6.25; No. 3, $10.50; No. 4, $13.50..15&10%
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists'.....40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Parallel Bar..... 15%
Perfect, 15%; Lightning Grip..... 15%
Merrill's 25%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars....20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Rock Island..... 25%
Snediker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers'....60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe..... 70%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up..... 60¢
B. E., 9 and 10..... .70¢
B. E., 8..... .80¢
B. E., 7..... .80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Dis. 15%
Ely's B. E.,11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs .....$2.75@$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
El-an-ge ..... 60&10%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles ..... 65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd..... 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles ..... 65&5%
Solid Steel Kettles..... 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

No.	℔ doz.
800—Brass King, Single Surface, Open Back	$2.80
862—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Pail Size	$1.25
St. Louis Washboard Co.	
Ben Hur, Brass, Open Back	$2.50
Brass Key, Open Back	$2.75

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ⅞ 1 1¼ 1¼ inch. 9¢ 10¢ 11¢ 14¢ per box.

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.90 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ℔ 100 lb. discl.; in 100 lb kegs add 10¢ net ℔ 100 lb; in 5 or 10 lb boxes, add 50¢ net ℔ 100 lb; in 1 lb boxes, add $1.00 net ℔ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish.....lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per net ton.....$24.00@

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.50.

Wire and Wire Goods—

Market and Stone Wire in Bundles—

Bright and Annealed:
9 and coarser.....80%
10 to 18.....80&10%
19 to 26.....80&10&2½%
27 to 36.....80&5%
Galvanized:
9 and coarser.....75&10%
10 to 16.....75&10%
17 to 26.....72½&10%
27 to 36.....72½%
Coppered:
9 and coarser.....75&10%
10 to 26.....75&10%
27 to 36.....70&10&5%
Tinned:
6 to 18.....75&10&10%
Brass.....15¾¢ lb., base
Copper.....14½¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box. $1.90@$2.10
Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....90&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 24 to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75&10@80%
Alligator or Crocodile.70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S.....45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut..... 50&5%
Combination Black..... 50&5%
Merrick Pattern..... 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl...40&10&5&3
Coes' Genuine Steel Hdl...40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 30%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&10%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W..50&10%; full cases..... 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain..... 50%
Other Wrenches..... 50%
Vulcan and Atrippa Chain..... 50%
Whitaker Machinists'..... 50&10%
Wizard Adjustable Ratchet..... 50%

Fruit Jar—

Beni, P. Forbes, Triumph, ℔ gro., $7.50; per doz..... $0.90

Wrought Goods—

Staple Hooks, &c., list March 17, '02.....90@—%

Zinc— *(Cask lots at mill.)*

Sheet .....per 100 lb., $7.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅞ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ ℔ 1.80¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.00¢
Rods—⅝ and 11-16 round and square	₩ ℔ 2.00¢

Angles:

	Cts ₩ ℔
3 in. x ¼ in. and larger	2.05¢
3 in. x 3-16 in. and ⅛ in.	2.25¢
1½ to 2½ in. x ⅛ in.	2.05¢
1½ to 2¾ in. x 3-16 in. and thicker	1.95¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅞ x ⅛ in.	2.25¢
¾ x ⅛ in.	2.45¢
⅝ x ⅛ in.	3.45¢
½ x 3-32 in.	3.95¢

Tees:

1 in.	2.35¢
1¼ in.	2.15¢
1½ to 2½ in.	2.00¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.15¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.30¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.80¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ ℔ 2.80¢	2.90¢
Nos. 18 to 21	₩ ℔ 2.85¢	3.00¢
Nos. 22 and 24	₩ ℔ 2.95¢	3.10¢
No. 26	₩ ℔ 3.00¢	3.10¢
No. 28	₩ ℔ 3.10¢	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ ℔ 12 @14½

Patent Planished, W. Dewees Wood, ₩ ℔ A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ ℔, 2.85¢
Nos. 22 to 24	₩ ℔, 3.20¢
No. 26	₩ ℔, 3.45¢
No. 28	₩ ℔, 3.75¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ ℔ .5 75¢
No. 26	₩ ℔ .6.25¢
No. 28	₩ ℔ .7 25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24	₩ 100 sq. ft. $3.80	4.75
No. 26	₩ 100 sq. ft. 2.90	3.95
No. 28	₩ 100 sq. ft. 2.55	3.70

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.15
IX, 14 x 20	7.40

A. Charcoal:

IC, 14 x 20	$5.20
IX, 14 x 20	6.30

American Coke Plates—Bessemer-

IC, 14 x 20	107 ℔	$4.20
IX, 14 x 20		5.20

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 0
IX, 20 x 28 with an 8 lb. coating	10.00

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 20⅜¢ ₩ ℔

High Brass Rods—

List August 1, 1908. 14¾¢ ₩ ℔

Roll and Sheet Brass—

List August 1, 1908. 14¾¢ ₩ ℔

Brass Wire—

List August 1, 1908. 14¾ ₩ ℔

Copper Wire—

Base Price, Carload lots mill 15¢

METALS—

Tin—

Straits Pig ₩ ℔ 31½@32 ¢

Copper—

Lake Ingot	₩ ℔ 14½@14⅝¢
Electrolytic	₩ ℔ 14½@15 ¢
Casting	₩ ℔ 14 @14½¢
Sheet Copper Hot Rolled, 16 oz (quantity lots)	₩ ℔ 17 ¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ ℔ more than Polished.

Spelter—

Western ₩ ℔ 6 @6¼¢

Zinc.

No 9, base, casks, ₩ ℔ 7.50¢ | Open ₩ ℔ 8.00¢

Lead.

American Pig	₩ ℔ 5¼@5½¢
Bar	₩ ℔ 6⅛@6¼¢

Solder.

½ & ½, guaranteed	₩ ℔ 20 @20¼¢
No. 1	₩ ℔ 17½@17¾¢
Refined	₩ ℔ 15¼@15⅝¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ ..@10¢
Hallett's	@9½¢
Other Brands	@9 ¢

Bismuth—

Per ℔ $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting	24¢
Rods & Wire	Base Price 38¢
Sheets	Base Price 34¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ ℔ 11.50@11.75
Copper, Heavy and Wire	₩ ℔ 11.00@11.25
Copper, Light and Bottoms	₩ ℔ 9.75@10.00
Brass, Heavy	₩ ℔ 7.25@ 7.50
Brass, Light	₩ ℔ 6.00@ 6 25
Heavy Machine Composition	₩ ℔ 10 00@10.25
Clean Brass Turnings	₩ ℔ 7.00@ 7.25
Composition Turnings	₩ ℔ 8.00@ 8.25
Lead, Heavy	₩ ℔ 3.50@ ....
Lead Tea	₩ ℔ 3.25@ ....
Zinc Scrap	₩ ℔ ....@ 8.25

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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